



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (COMPREHENSIVE  
PROJECT REPORT)  
FOR**

**FOR PROPOSED REHABILITATION AND EXPANSION OF HEWANI SOLAR  
SMALL-SCALE IRRIGATION SCHEME IN HEWANI VILLAGE, GARSEN NORTH  
WARD, TANA DELTA-SUB COUNTY IN TANA RIVER COUNTY**

**GPS COORDINATES: S02° 14.363' E040°10.819'**



**SUBMITTED BY:**

**FREDRICK O. ALOO**

EIA/EA LEAD EXPERT REG.NO 9049, 0726589117 [fredrick.aloo@gmail.com](mailto:fredrick.aloo@gmail.com)

P. O. BOX 45963-00100, NAIROBI, KENYA

**SUBMITTED TO:**

**THE COUNTY DIRECTOR,**

**NATIONAL ENVIRONMENTAL AUTHORITY, TANA RIVER COUNTY**

**JUNE, 2021**

Commented [JMA1]: OCT

---

---

**DOCUMENT AUTHENTICATION****Certification by Proponent (client)**

This report was prepared for and on behalf of:

**THE COUNTY PROJECT COORDINATOR (CPC) KCSAP- TANA RIVER**

Ministry of Agriculture, Livestock and Fisheries,

P.O. Box 10-70101

**TANA RIVER**

The County Project Coordinator, Kenya Climate Smart Agriculture Project (KCSAP), hereby confirm that the contents of this ESIA (Comprehensive Project Report) are true to the best of my knowledge and that I shall implement the mitigation measures proposed in this report and undertake to implement further instructions as **NEMA** may deem appropriate in relation to the findings of this project report and from time to time as inspections may inform



Signed by: - Peter Munyoki

Institution: - County Project Coordinator (CPC)

Date: - 15<sup>th</sup> June, 2021

**Certification by ESIA & EA Lead Expert**

**Fredrick Onyango Aloo** ESIA lead expert registered and licensed by the National Environment Management Authority (License No. 9049) and also are members of Environmental Institute of Kenya (**EIK**) confirms that the contents of this report are a true representation of the Comprehensive Project Report study of the proposed rehabilitation and expansion of Hewani solar small-scale irrigation scheme in Hewani village, Garsen North ward, Tana Delta-sub county in The study of the report was done under my supervision and that the assessment criteria, methodology and content reporting conforms to the requirements of the Environmental Management and Coordination Act (EMCA, 1999), Environmental (Impact Assessment and Audit) Regulations.2.

Signed by the ESIA/EA LEAD EXPERT.9049

Name: - Fredrick Onyango Aloo

Signature:- 

Date: - 15<sup>th</sup> June, 2021

---

---

## TABLE OF CONTENTS

DOCUMENT AUTHENTICATION.....	i
<b>TABLE OF CONTENTS .....</b>	<b>ii</b>
ACRONYMS / ABBREVIATIONS .....	1
EXECUTIVE SUMMARY .....	2
CHAPTER ONE: INTRODUCTION .....	4
1.0 Introduction.....	4
1.1 Justification .....	4
1.1.1 Objective of ESIA.....	<a href="#">54</a>
1.2 Study Methodology .....	5
1.2.1 Primary data.....	5
1.2.2 Secondary data .....	5
CHAPTER TWO: PROJECT DESCRIPTION.....	6
2.0 Introduction.....	6
2.1 Overview .....	6
<b>2.1.1 Project Cost</b> .....	6
2.1.2 Irrigation design.....	<a href="#">76</a>
2.1.3 Design Calculations.....	7
2.1.4 Design data and capacity of soil water content .....	7
2.1.5 Capacity of the drip irrigation.....	<a href="#">87</a>
CHAPTER THREE: POLICY, LEGAL AND REGULATORY FRAMEWORK .....	9
3.0 Introduction.....	9
3.1 Policy Framework .....	9
3.1.1 National Water Policy.....	9
3.1.2 Policy on Environment and development .....	9
3.1.3 Kenya ASAL Policy-Sessional Paper No. 8 of 2012 .....	<a href="#">109</a>
3.1.4 National Land Policy (2009).....	10
3.1.5 Agricultural Sector Transformation and Growth Strategy 2019-2029.....	10
3.2 Legal Framework.....	10
3.2.1 Constitution of Kenya 2010.....	<a href="#">1140</a>
3.2.2 Environmental management and coordination ACT (EMCA), Cap 387 .....	11
3.2.3 Water Act No. 43 of 2016.....	11
3.2.4 Water Quality Regulations, 2006, (Legal Notice No 121).....	<a href="#">1244</a>
3.2.5 Water Resource Management Rules, 2007 .....	12
3.3 Irrigation policy and Regulatory framework.....	<a href="#">1342</a>
3.3.1 National Irrigation and Drainage Development Policy .....	<a href="#">1342</a>

3.3.2 Irrigation Act (CAP 347).....	13
<b>3.4 Environmental policy and Regulatory framework .....</b>	<b>13</b>
3.4.1 Environmental Management & Coordination Act Cap 387 .....	13
3.4.2 The Environmental (Impact Assessment and Audit) Regulations 2003.....	14
3.4.3 Environmental Management and Coordination (Conservation of biological diversity (BD) Regulations 2006 .....	14
3.4.5 Environmental Management and Coordination (Wetlands, Riverbanks, Lakes Shores and Sea Shore Management) Regulations 2009 .....	<a href="#">15</a> <del>14</del>
3.4.6 Environmental Management and Coordination (Controlled Substances) Regulations 2007.....	<a href="#">15</a> <del>14</del>
3.4.7 Environmental Management and Coordination (Water Quality) Regulations 2006.....	15
3.4.8 Environmental Management and Coordination (Waste Management) Regulations 2006 .....	15
3.4.9 Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006 .....	<a href="#">16</a> <del>15</del>
3.4.10 Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Regulations 2007.....	16
3.5.1 The land Act, 2012 (Legal Notice 6) .....	16
3.5.2 County Government Act 2012 .....	17
3.5.3 The Community Land Act, 2016.....	17
<b>3.6 Health Policy and regulatory framework .....</b>	<b>17</b>
3.6.1 Occupational Health and Safety Act, 2007 .....	17
3.6.2 Public Health Act (Cap 242) .....	<a href="#">18</a> <del>17</del>
3.6.3 Work Injury Benefits Act (WIBA), 2007 .....	18
3.6.4 HIV /AIDS Prevention and Control Act 2006 and Gender Mainstreaming: .....	18
3.6.5 The Sexual Offences Act, 2006 .....	<a href="#">19</a> <del>18</del>
3.6.6 Kenya National Youth Policy 2019 .....	<a href="#">19</a> <del>18</del>
<b>3.7 Institutional Framework .....</b>	<b>19</b>
3.7.1 The National Environmental Council .....	19
3.7.2 The National Environmental Management Authority .....	19
3.7.3 The Standards and Enforcement Review Committee.....	19
<b>3.8 World Bank Environmental safeguards .....</b>	<b>19</b>
3.8.1 OP/BP 4.01 (Environmental Assessment).....	19
3.8.2 OP/BP 4.04 (Natural Habitats) .....	20
3.8.3 OP/BP 4.09 (Pests Management) .....	20
3.8.4 OP/BP 4.10 (Indigenous Peoples).....	20
3.8.5 OP/BP 4.11 (Physical Cultural Resources) .....	21

3.8.6 OP/BP 4.12 (Involuntary Resettlement).....	21
3.9 International Conventions.....	22
3.9.0 Introduction.....	22
3.9.1 The World Commission on Environment (the Brundtland Commission of 1987).....	22
3.9.2 The Ramsar Convention on Wetlands of International Importance .....	22
3.9.3 Convention on Biological Diversity (CBD) .....	<del>23</del> <sup>22</sup>
3.9.4 Rio Declaration on Environment.....	<del>23</del> <sup>22</sup>
3.9.5 United Nations Framework Convention on Climate Change .....	23
3.9.6 United Nations Convention to Combat Desertification 1994:.....	23
3.9.7 Sustainable Development Goals.....	23
CHAPTER FOUR: BASELINE INFORMATION .....	24
4.0 Introduction.....	24
4.1 Location and size.....	24
4.2 Soils .....	<del>25</del> <sup>24</sup>
4.3 Ecological and Climatic Conditions .....	25
4.4 Vegetation Conditions .....	25
4.5 Demographic attributes.....	<del>26</del> <sup>25</sup>
4.6 Infrastructural access .....	<del>26</del> <sup>25</sup>
4.7 Land Ownership.....	<del>26</del> <sup>25</sup>
4.7.1 Crop production.....	<del>26</del> <sup>25</sup>
4.7.2 Climate change effects .....	26
CHAPTER FIVE: PROJECT ALTERNATIVES .....	27
5.0 Introduction.....	27
5.1 No Project Alternative.....	27
5.2 Alternative Project site .....	<del>28</del> <sup>27</sup>
5.3 Relocation Option .....	<del>28</del> <sup>27</sup>
5.4 Analysis of Alternative Construction Materials and Technology.....	28
5.4.1 Irrigation Technology Option.....	28
CHAPTER SIX: PUBLIC CONSULTATIVE PROCESS AND DISCLOSURE .....	30
6.0 Introduction.....	30
6.1 Objectives of the Public Consultations/meetings .....	30
6.2 Participation Consultation/Interviews .....	<del>31</del> <sup>30</sup>
6.2.1 Sources of Information .....	31
6.2.2 Key issues arising from public participation meetings.....	<del>33</del> <sup>32</sup>
6.2.3 Perceived Benefits .....	<del>33</del> <sup>32</sup>

6.2.4 Issues of concern.....	33
<b>CHAPTER SEVEN: ANTICIPATED IMPACTS AND PROPOSED MITIGATION MEASURES .....</b>	<b>3534</b>
7.0 Introduction.....	3534
7.1 Impacts during Construction phase .....	3534
7.1.1 Anticipated Positive impacts during Construction phase.....	3534
a) Employment opportunity.....	3534
7.1.2 Anticipated Negative Environmental Impacts during Construction phase.....	3534
7.1.3 Anticipated Negative Social and health Impacts during Construction phase .....	3837
7.2 Operation Impacts during the Operation phase .....	4742
7.2.1 Positive Impacts.....	4742
7.2.2 Negative Environmental Impacts during operation phase.....	4842
7.2.3 Anticipated health and social impacts during operation phase .....	5246
7.3 Anticipated Impacts during the decommissioning phase .....	5651
7.3.1 Decommissioning activities.....	5651
7.3.2 Positive Decommissioning Impacts.....	5751
7.3.3 Negative Decommissioning Impacts .....	5751
<b>CHAPTER EIGHT: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN .....</b>	<b>5852</b>
8.1 Responsibilities.....	5852
8.2 ESMMP monitoring.....	5852
8.3 Design and Construction Phase .....	5852
8.4 Environmental Social, Management and monitoring plan during operation phase.....	6559
8.6 EMMP for the Decommissioning phase .....	7367
<b>CHAPTER NINE: CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>7868</b>
9.1 Introduction.....	7868
9.2 Conclusion .....	7868
9.3 Recommendations .....	7868
REFERENCES.....	7969
ANNEXES .....	8070
Annex 1: Duly Filled ESS Screening Checklist .....	8070
Annex 2: Land Ownership Documents .....	8878
Annex 3: Minutes of the Community Consultation Meetings .....	8979
Annex 4: Attendance list.....	9383
ANNEX 5: Public Consultation Questionnaire.....	9484
Annex 6: Sample Questionnaire Filled by Respondent .....	9585

<b>Annex 7: Photos On public consultation and filling of questionnaire.....</b>	<b><u>9989</u></b>
<b>Annex 8: Irrigation Infrastructure Design and Layout.....</b>	<b><u>10191</u></b>
<b>Annex 9: EIA Certificate and Practicing License .....</b>	<b><u>10393</u></b>

**LIST OF TABLES**

<b>Table 1 Number of members of specific blocks.....</b>	<b>4</b>
<b>Table 2: A Summary of gross margin analysis.....</b>	<b>6</b>
Table 3: Available water content ranges for different soil type .....	7
<b>Table 4 Advantages of Drip Irrigation system .....</b>	<b><u>2928</u></b>
<b>Table 5: Environmental, social management and monitoring plan during construction phase...</b>	<b><u>5953</u></b>
<b>Table 6: Environmental Social Management and Monitoring plan for operation phase .....</b>	<b><u>6559</u></b>
<b>Table 7: EMP for decommissioning phase of proposed project .....</b>	<b><u>7367</u></b>

**LIST OF FIGURES**

Figure 1 Map indicating the site of proposed Makere Ya Gwano Irrigation Scheme Courtesy of google earth .....	<u>2523</u>
---	-------------

**LIST OF PLATES**

<u>Plate 1: Lead expert consulting with community members of Hewani Village as they fill the individual questionnaire .....</u>	<u>3230</u>
<u>Plate 2: Lead Expert undertaking focused group discussion interview with some of the members .....</u>	<u>3230</u>
<u>Plate 3: Visit to some of the ongoing irrigation plats which are yet to be rehabilitated.....</u>	<u>9982</u>
<u>Plate 4: The team undertaking public participation with Hewani Community members .....</u>	<u>9982</u>
<u>Plate 5: Existing borehole where water will be pumpe/ piped r to the existing farms under irrigation</u>	<u>1018</u>

Field Code Changed

Field Code Changed

Field Code Changed

Field Code Changed

---

---

**ACRONYMS / ABBREVIATIONS**

<b>ASALS</b>	Arid and Semi-Arid Lands
<b>A.S.L</b>	Altitude above sea level
<b>CBD</b>	Convention on Biological Diversity
<b>CDIP</b>	County Development Integrated Plan
<b>COVID 19</b>	Corona Virus Disease <del>19</del>
<b>C-ESMP</b>	Construction Environmental and Social Management Plan
<b>EA</b>	Environnemental Audit.
<b>ESIA</b>	Environnemental and Social Impact Assessment
<b>EMCA</b>	Environmental Management Coordination Authority.
<b>EMP</b>	Environmental Management Plan.
<b>ESMMP</b>	Environmental and Social Management & Monitoring Plan
<b>FGD</b>	Focused Group Discussion
<b>GBV</b>	Gender Based Violence
<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>KFS</b>	Kenya Forest Services
<b>KWS</b>	Kenya Wild services
<b>NEMA</b>	National Environmental Management Authority.
<b>NEAP</b>	National Environmental Action Plan.
<b>NPEP</b>	National Poverty Eradication Plan
<b>PAPs</b>	Project Affected Persons (PAPs)
<b>PLWD</b>	People Living with Disabilities
<b>PPE</b>	Personal Protective Equipment
<b>PVC</b>	Polyvinyl chloride
<u><b>SEA</b></u>	
<u><b>SH</b></u>	
<b>KCSAP</b>	Kenya Climate Smart Agriculture Project
<b>OSH</b>	Occupational, Safety and Health
<b>OSHA</b>	Occupational, Safety and Health Act.
<b>ASALs</b>	Arid and Semi-Arid Lands
<b>ToR</b>	Terms of Reference.
<b>VMGs</b>	Vulnerable Marginalized Groups
<b>WB</b>	World Bank
<u><b>WHO</b></u>	

**Commented [JMA2]:** 1.Read through draft ESIA Report and update the missing A&A. This will include among others:

-SEA  
-SH  
-OP  
-WHO  
-Etc.

2. Arrange in alphabetical order.



---

---

## EXECUTIVE SUMMARY

This document is an Environmental and Social Impact Assessment (ESIA) Comprehensive Project Report (CPR) for the proposed Hewani Solar Small-Scale Irrigation Scheme in Hewani Village, Garsen North Ward, Tana Delta-Sub County, in Tana River County. It is located in GPS coordinates S02° 14.363' E040°10.819'. The project aims at promotion of maize and high value crop production in the region and is funded by the Kenya Climate Smart Agriculture Project (KCSAP). A Comprehensive Project report has been prepared for submission to the National Environment Management Authority (NEMA) for review and licensing or for further guidance. Among the legislation reviewed included The Constitution of Kenya, 2010; the Environmental Management and Coordination Act, 1999 (Revised 2015) and its subsidiary legislations; the Irrigation Act, 2016; Public Health (Prevention, Control and Suppression of COVID-19) Rules, 2020; and Sexual Offenses Act, 2006.

The objectives of the CPR were to identify and evaluate the environmental and social effects, impacts and risks, which could arise from the proposed construction and operation of the project's activities. This is a World Bank supported project and triggers OP 4.01 (Environmental Assessment), which requires preparation of an Environmental and Social Management and Monitoring Plan

The methodology of the study entailed site visits, public meetings and key informants' discussions. Three different meetings were held at the proposed site on 5<sup>th</sup> June 2021. A total number of 50 members of Hewani farmers' cooperative, area residents; and key stakeholders from government departments participated. Among the persons who attended the meeting were Vulnerable and Marginalized Groups (VMGs) especially women, youths and people living with disabilities. Consultations were done with key stakeholders and 15 questionnaires were randomly distributed to area residents and selected key government departments for filling. Minutes for these meetings are attached to this report.

Representatives from the various government departments were the Tana River Kenya Climate Smart Agriculture Project (KCSAP) Coordinator, value chain heads and County Director of Irrigation; County Director of National Environment Authority, County Ecosystems Conservator and Kenya Wildlife Services. From the public consultation process, it was evident that the people have no objection with the proposed project at the proposed site.

Among the benefits anticipated from the project as per the consultations were: employment creation, increase in income from sale of produce from the proposed irrigation and enhanced household food and nutrition security status. The following negative environmental impacts were raised in the various meetings; de-vegetation cutting of trees and excavating the sites for drip irrigation, increased runoff and soil erosion. Noise levels are likely to increase during construction. Pollution through air emissions and dust that emanate from construction activities especially from exhaust pipes for vehicles and machinery used. Negative social impacts raised were on gender based violence, sexual exploitation and harassment, child labor, HIV/AIDs

**Commented [ORM3]:** Construction or rehabilitation? The title suggests it is rehabilitation and expansion. Refer to the concept of Brown versus Greenfield

**Commented [ORM4]:** Key informant interviews not discussions. If discussions, then focused group discussions

**Commented [ORM5]:** Summarize and present here the key issues/ concerns that were raised during the public consultations and how they were or have been addressed

**Commented [ORM6]:** What is de-vegetation cutting?

prevalence is likely to increase and risks of contracting Covid 19 at work sites and among community members during consultations.

Commented [ORM7]: Review ...

Some of the proposed mitigation measures to the impacts ~~include~~ ~~are~~ ~~to~~ encourage planting of grass and trees after flattening the soils and backfilling and digging of trenches, using machines with less vibrations and encourage workers to wear ear masks to control noise pollution. On Occupational Health and Safety, it was proposed that the proponent provide personal protective equipment— such as suitable gloves, footwear, and goggles and head coverings. There will be provision of solid waste collection facilities and sensitization of construction workers on proper disposal of solid wastes. Temporary latrines will be constructed on site to be used by workers. Oils and greases emanating from repair and maintenance activities will be collected in containers and reused or taken away by licensed waste handlers to avoid entry into local drainage channels. On Covid 19, the proponent and community members shall ensure adherence to health guidelines provided like wearing of face masks, social distancing, hand washing, and use of sanitizers. Water use conflicts are likely to occur; therefore, farmers will be trained on water use. ~~There will be enforcement of Water Act 2016.~~ The proponent shall encourage establishment of an Irrigation Water Use Committee Manual and mechanical removal of the invasive species

Commented [ORM8]: This is generic... You specify those actions, activities, etc. to be undertaken to comply with the Act

Commented [ORM9]: For what?

Commented [ORM10]: Will the project result in spread of invasive species? This was not highlighted above as some of the impacts.

The project is expected to directly impact on a total of 530 HH in both crop production and domestic water use. The overall responsibility for the implementation of the ESMMP lies with the project management committee and the contractor. The ESMMP will be implemented at a cost of Kshs 1,415,000. The community noted that project will go a long way in solving their chronic food insecurity that have haunted them for years. They however requested cooperation between the proponent and their leaders so as to ensure smooth implementation. The entire project is estimated at a cost of approximately Kshs 35,000,000

### Recommendations

It is recommended that a copy of the environmental and social management plan be given to the contractor prior to construction. The contractor needs to demonstrate how the ESMMP will be implemented in the construction process and the proponent must implement ESMMP during operation phase

### Conclusion

The proposed project DOES NOT pose any irreversible environmental impact. ~~The s-~~ ~~identified~~ ~~that~~ are generally related to development projects and the mitigation measures for those that have been clearly articulated. The positive environmental impacts surpass the few and minor negative impacts that have been identified. The negative environmental impacts have been detailed in environmental social management plan, which will be executed during the project implementation and operation phases to safeguard the environmental interests. In view of the anticipated benefits, the community members were in agreement with implementation of the project and are eagerly waiting for it to commence.

Commented [ORM11]: ? What exactly are you saying here? I did not understand

Commented [ORM12]: You already indicated above that there is broad-based community support for the project. So, this here is not necessary

The review of this ESIA is undertaken during the Coronavirus Disease (COVID-19) pandemic outbreak. The preparation of the ESIA including the relevant consultations have been

Formatted: Left, Line spacing: 1.5 lines

undertaken in strict compliance with guidelines for infection prevention and control in the country. Additionally, specific mitigation measures have been introduced to prevent the spread of the pandemic during the construction period.

**Commented [JMA13]:** Adopt here!  
**Formatted:** Font: Calibri

## CHAPTER ONE: INTRODUCTION

### 1.0 Introduction

Hewani irrigation Scheme lies along the River Tana in Garsen Division within the Tana Delta. For many years, Hewani Cooperative farmers have heavily relied on the Agriculture sector; crop production, livestock, as well as cooperatives to boost its economy. Approximately 80% of Garsen North's ward population is involved in ~~Agriculture~~ agriculture either directly or indirectly. Although most people depend on the sector for their livelihoods, agriculture has been affected by the unpredictability of rains for crop growth. Improved productivity can be realized through irrigation and as a result generate higher economic growth reducing the rate of poverty. While directly benefiting 530 Households in Hewani Village, the proposed rehabilitation of the Hewani drip irrigation project will indirectly benefit four other villages; Wema, Kulesa, Gamba, and Bandi in Garsen North Ward.

**Commented [ORM14]:** Hewani Cooperative Farmers or Hewani Farmers' Cooperative Society? Please always review and proof-read your work

The Irrigation scheme will utilize water from an existing borehole, located at the Hewani Lutheran Church with a yield capacity of 18m<sup>3</sup>/hr. The scheme was partitioned into 5 blocks as shown in Table 1 below, although 30 acres will be considered in the pilot project.

**Commented [ORM15]:** And where are the 530 hh located? Which willages?

**Commented [ORM16]:** On one hand you mention that the scheme lies along Tana River, which suggests that the river is the source of water for irrigation. On the other hand you indicate water will be sourced from a borehole. So, which one will be the source of water? Also, be clear whether this is a rehabilitation and expansion of an existing scheme or it is a new one altogether.

**Commented [ORM17]:** Always make references to your Tables and Figures in the Text. Just a tip

**Table 1** Number of members of specific blocks

Block Name	No. of Members	Old Scheme Irrigable Area		New Scheme Irrigable Area
		Acres	Hectares	Acres
Block 1	21	21	8.4	10
Block 2	26	26	10.4	10
Block 3	25	25	10	10
Block 4	21	21	8.4	0
Block 5	42	42	16.8	0
Additional	12			
<b>TOTALS</b>	<b>147</b>	<b>135</b>	<b>54</b>	<b>30</b>

### 1.1 Justification

The Hewani area has a high agricultural potential, restricted primarily by limited and erratic rainfall. In the absence of irrigation, some subsistence agriculture is taking place and livestock such as goats are kept. Communal land ownership does result in over grazing, exacerbated by the absence of a fence. At present, 135 acres are developed for irrigation with 147 farmers. Open surface irrigation takes the whole 135 acres. Although, the project collapsed because of lack of water- River deviated at the Kitere area, drip irrigation is viable and can be used to address food insecurity in the area

#### 1.1.1 Objective of ESIA

The aim of this environmental and social impact assessment will be to identify significant potential impacts of the proposed project to environment, social, economic and health aspects

**Commented [ORM18]:** Check your tenses. The assessment has been done so it cannot 'will be'.

---

---

and formulate recommendations to ensure that the project takes into consideration appropriate measures to mitigate any likely adverse impacts to the environment and people's health livelihood through all phases of its construction and implementation.

The specific objectives include to: -

- Evaluate social-economic conditions and human health. This would include but not limited to issues such as archeology, cultural heritage, landscape aspects, recreational, social, economic aspects, land ownership, land use, infrastructure, agricultural development, and human health.
- Prepare Environmental Management Plan for the three stages of the project which will also be used for subsequent yearly audits
- Prepare an ESIA (CPR) report in accordance with the environmental legislation guidelines and submit to NEMA for further instructions and / or approval.

## 1.2 Study Methodology

### 1.2.1 Primary data

Primary data was collected using the following methods:

- Direct field observation through site walks, to identify land uses, topography, soil types the state of environment and other key environmental issues
- Administration of questionnaire (15 questionnaires were administered and filled). [Sample-sample filled-in questionnaire is attached in Annex IV.](#)
- Focused Group discussion with members of the community and Hewani Community Based Organization on the proposed project and general life
- Interviews with key informants from the various sectors, the provincial administration and institutions near proposed site of the project
- Discussion with field officers and their experiences in the proposed area as this is their working area; Among the officers were from, Kenya Wildlife Service (KWS), Kenya Forest Service (KFS), County Environment Officers, Department of Agriculture, Department of livestock, National Museums of Kenya (NMS), Governor office/ Ward office, WRA (Water Resources Authority), Water Department, Department of Irrigation, Fisheries Department Chief- Hewani location. TARDA

### 1.2.2 Secondary data

**Detailed desktop study** was conducted on reports from all the specialized sectors integrated with the project. The information was obtained from the following partners: Department of Social services, Department of Public Health, Departments of Agriculture and Irrigation Livestock, Kenya Wildlife Services in Tana River county, County NEMA office also provided the needed information coupled with the County Government who provided the detailed County Integrated Development Plan (CIDP). Also had a meeting with the client (proponent) the County Project Coordinator (CPC) to obtain more and relevant literature on the project operation in the county. The ESIA field studies, desk data collection, community participatory meeting and analysis were undertaken from 5<sup>th</sup> June, 2021 to 23<sup>th</sup> June, 2021. The purpose was to generally evaluate the types, mode of action, dynamics and magnitude of the specific projected effects and impacts, both favorable and detrimental to the environment and natural resources at the project site

### 1.3 Structure of the report

The report has an executive summary and is organized into ten substantive chapters. Following this introductory chapter 1, Chapter 2 gives a highlight on policy legal and regulatory framework, a description of the existing environmental and social baseline is in chapter 3. Chapter 4 describes the project design, project construction and operation. The project alternatives are elaborated Chapter 5. Public participation, consultation process and views of the stakeholders is presented in Chapter 6. The Chapter 7 identifies and discusses the Potential

environmental and social impacts and mitigations while chapter 8 provides Environmental Social Management and Monitoring Plan. Chapter 9 is the conclusions and recommendation. This is followed by some of the literature sources consulted (References) and Annexes to the report.

## CHAPTER TWO: PROJECT DESCRIPTION

### 2.0 Introduction

The chapter describes the project and major activities that will be ~~involved-undertaken~~ during project implementation, the materials that will be used and the possible alternatives detailed in the next section

### 2.1 Overview

The Tana River County government has prioritized interventions in agriculture ~~that seek~~ to improve crop production since agriculture is the mainstay of ~~the county's residents~~ community. Increasing the irrigated land in the county will ensure a secure production of staple as well as high value crops that increase the farmers' income.

The proposed project activities in planning phase, will be a topographical survey designs, layout of the scheme, calculations on water demand for crop and livestock. During construction phase there will be installation of solar powered pumps and accessories, a pontoon system, a conveyance system, and infield distribution chambers. Excavation will be done to layout piping along the channels and water conveyance to the irrigation plots about 750m away through a 6" diameter Upvc pipeline. Water application in the farm will be through gravity flow through infield pipelines which will in turn discharge water through riser pipes into distribution chambers and off takes.

**Commented [ORM19]:** These should have already been done, right?

**Commented [JMA20]:** It seems that the laying of pipelines will not traverse vast areas so as to require consent for access. If this is the case please clarify and there may then be no need to seek consent as captured in the consultations minutes.

Pls confirm and make consistent.

The capital cost to provide irrigation to this area was subsequently calculated so as to formulate an opinion as to whether it would be financially viable to implement (should water from boreholes be available). The total irrigation development costs were found to be KES 35 million (including bulk and infield infrastructure costs) depending on the scenario. A gross margin for the selected enterprises was estimated. Gross margins represent income from the sale of the crop less all direct costs that can be allocated to the production of the specific enterprise.

**Table 2: A Summary of gross margin analysis**

**Commented [ORM21]:** What is the added value of this Table in this ESIA?

A SUMMARY OF GROSS MARGIN ANALYSIS PER ACRE						
Crop	Yield/acre	Farm-gate Price (KShs)	Selling Price (KShs)	Total Cost (KShs)	Overhead Cost	Net Return (KShs)
Watermelon	20 ton	KShs. 13/ kg	260,000	58,850	20,000	181,150
Tomatoes	25 ton	KShs. 50/kg	1,250,000	97,400	30,000	1,122,600
Bulb Onions	16 ton	KShs. 50/kg	800,000	85,050	20,000	694,950
Kales	15 ton	KShs. 20/kg	300,000	57,200	20,000	222,800

In terms of enterprises, tomatoes are more viable than other crops however they are more capital intensive. For resource poor farmers the maize-barley rotation may be more affordable. It should be noted that maize grown on its own is not a viable option.

**Commented [ORM22]:** So, which crops are targeted for irrigation? This should be clear

**The project will have total investment cost of Kshs 35,000,000**

**2.1.2 Irrigation design**

The evapotranspiration calculated for the crops, the characteristics of protected agriculture in Kenya and the analysis of monthly rainfall data clearly indicating the need for irrigation in the Hewani area. The next stage is to choose the most convenient means of conveying and distributing the water within the command area.

The main components of an irrigation system include, an intake structure or pumping station, a conveyance system, a distribution system, a field application system supported by a drainage system.

- The intake structure or pumping station, directs water from the source of supply, such as a reservoir or a river, into the irrigation system
- The conveyance system assures the transport of water from the main intake structure to the area to be irrigated.
- The distribution system assures the transport of water through the project area
- Field application system assures the application of water within the fields
- The drainage system removes the excess water from the fields

Commented [ORM23]: I miss something about the Intake structures?

Commented [ORM24]: Okay

**2.1.3 Design Calculations**

**Water Demand Areas**

Based on the water needs of Hewani village community, Water demand has been classified into the following categories

- Household/ domestic water demand,
- Institutional water demand
- Crop water demand
- Livestock Water demand
- Commercial and Cultural water demand.

**2.1.4 Design data and capacity of soil water content**

The upper limit is field capacity: Any more water than this will drained out of the soil profile, runoff at the surface or may cause waterlogging problems.

The absolute lower limit is the permanent wilting point; however, the plant will suffer stress long before this is reached, and therefore the practical lower limit is the easily available water capacity, i.e. that amount of water that can be extracted without stress.

This will depend on

- The soil (total available water capacity per m of soil)
- Crop type (fraction of Available Water Content that is easily available)
- Root depth (depth of soil that can be exploited by the plant)

Soil characteristics are critical in designing a suitable irrigation system for soil-based production systems. The ultimate aim of the design is to provide the optimum conditions for plant growth and development by maintaining the soil moisture content at levels where water is readily available. It is envisaged that this condition will encourage sustained investment in food production.

*Table 3: Available water content ranges for different soil type*

Soil Type	Available Water Content in mm Water Depth Per m Soil Depth (mm/m)
Sand	25-100
Loam	100-175
Clay	175-250

**2.1.5 Capacity of the drip irrigation**

Applying small amounts of water slowly and frequently through emitters spaced along polyethylene tape or tubing, potentially offers improved yields, more accurate and efficient irrigation, automation, as well as reduced fertilizer and chemical inputs. Drip irrigation are also

---

---

used in conditions where water resources are restricted. The characteristics of this type of system makes it the most popular form for irrigating under shade/protected structures.

- A pressurized water supply, usually from a pump or gravity intake structure.
- An efficient filter
- Mains and sub-mains, usually buried PVC
- Control head consisting of pressure regulator, filter, control valve and often a tank for introducing nutrients (Fertigation).
- A manifold pipe to which the laterals are connected.
- Lateral lines to which the emitters are attached. Laterals are usually flexible PVC or PE tubing, ranging from 10 to 32mm in diameter and have emitters spaced at short intervals appropriate for the crop to be grown.

---

---

### 3.0 Introduction

Kenya has a policy, legal and administrative framework for environmental management. The National Environmental Management Authority (NEMA) is responsible for ensuring that environmental impact assessments (EIAs) are carried out for new projects and environmental audits on existing facilities as per the Environmental Management and Coordination Act (Cap 387). **ESIAs** are carried out in order to identify potential positive and negative impacts associated with the proposed project with view to taking advantage of the positive impacts and developing mitigation measures for the negative ones.

**Commented [JMA25]:** Present below that it is also a world bank requirement

### 3.1 Policy Framework

The Kenya Government has in place an environmental policy for harmonizing conservation with its development plans. Using this combination, it becomes easy to sustainably use available natural resources to better quality of life.

#### 3.1.1 National Water Policy

The National Policy of Water which was promulgated in April 1999 as Sessional Paper No. 1 of 1999 calls for decentralization of operational activities from the central government to other sectors, including local authorities, the private sector and increased involvement of communities in order to improve efficiency in service delivery. It also tackles issues pertaining to water supply and sanitation facilities development, institutional framework and financing of the sector. *Emphasis is on rational and efficient framework for meeting the water needs for national economic development, poverty alleviation, environmental protection and social wellbeing of the people through sustainable water resource management through Hewani irrigation scheme initiatives.*

#### 3.1.2 Policy on Environment and development

In the Sessional Paper No. 6 of 1999 on Environment and Development, the overall goal is to integrate environmental concerns into the national planning and management process and provide guidelines for environmentally sustainable development. The key objective is to ensure all development policies, programs and projects take environmental considerations into accounts, and to enhance, review regularly, harmonize, implement and enforce laws for the management, sustainable utilization and conservation of natural resources. *Under this policy, broad categories of development issues have been covered that require sustainable approach which encompasses the use of Sustainable Land Management. The policy enhances participation of stakeholders in the management of natural resources within their respective localities at the proposed irrigation scheme.*

**Commented [ORM26]:** How has the project complied with these provisions? Or how will it contribute to the objectives of this policy?

#### 3.1.3 Kenya ASAL Policy-Sessional Paper No. 8 of 2012

The national policy titled 'Releasing our full potential', has five key elements among them affirmative action that equitable development needs the support of all Kenyans; an enabling environment for accelerated investment in 'foundations' to reduce poverty and build resilience & growth; a responsive government to the uniqueness of arid lands which include ecology, mobility, population distribution, economy and social systems. *The proposed irrigation scheme is situated in the ASALs and addresses the policy by promoting food and nutrition security*



---

through crop production. By building resilience in order to realize full potential of the Arid and Semi-Arid Lands and it aims at developing measures to manage drought & strengthen livelihoods

### 3.1.4 National Land Policy (2009)

The overall objective of the National Land Policy is to secure rights over land and provide for sustainable growth, investment and the reduction of poverty. The key thrust of the policy is to ensure that; citizens have opportunity to access and beneficially occupy and use land; equitable and sustainable use of land; efficient, effective and economical operation of land markets; efficient and effective utilization of land and land-based resources; and efficient and transparent land dispute resolution mechanisms. *The policy adopts a plural approach, in which different systems of tenure coexist and have equal guarantees of tenure security. Measures to secure livelihoods and tenure of land are proposed which ensures that all land use practices conform to the principles of sustainable resource management. The irrigation scheme project would conform to the principles of sustainable resource management.*

**Commented [ORM27]:** Proposed in the Policy or in this project? Make clear. Also, as mentioned on the ESIA report for Asako Water Project, explain what has been, is being and or will be done to comply with the relevant provisions of each of the discussed policy, law and regulation.

### 3.1.5 Agricultural Sector Transformation and Growth Strategy 2019-2029

The importance of agriculture has been emphasized in Kenya through Vision 2030 and the Medium Term Plan III and most recently the President's Big Four priority agenda for 2017-2022, which emphasizes the importance of 100% food and nutrition security for all Kenya. To transform Kenya's agricultural sector and make it a regional powerhouse, the Government has formulated the Agricultural Sector Transformation and Growth Strategy (ASTGS). The Strategy is based on the belief that food security requires a vibrant, commercial and modern agricultural sector that supports Kenya's economic development sustainably and its commitments to regional and global growth

**Commented [JMA28]:** Specify these. Also, present relevant information to show how this policy affects or is complied with by the project, mainly with respect to the land requirement for project implementation.

- ✓ *Nine flagships that serve as the core of our 10-year Agricultural Sector Growth and Transformation Strategy (ASTGS) have been developed. The flagships were drawn on the status of our agriculture today, a rigorous and thorough review of data, lessons from global best practices, and our local realities. Among the key flagships is support to irrigation infrastructure including irrigation, which is the focus of the proposed project. Achieving our potential in agriculture will achieve food and nutrition security, improve our farmer and local community incomes, lower the cost of food, increase employment (particularly for women and youth).*

## 3.2 Legal Framework

There are several pieces of legislation and policy documents related to this kind of development in Kenya. These include, but not limited to the Constitution of Kenya 2010, the Environmental Management and Coordination Act (No 8 of 1999), Sessional Paper No 9 of 1999 on Environment and Development, the Public Health Act (Cap.242) the County Government Act (No 17 of 2012), the Factories and Places of Work Act (Cap.514), the Community Land Act (No 27 of 2016), National Environmental Action Plan (NEAP), Sustainable Development Goals(SDGs), Millennium Declaration and **Brundtland** Commission Report ("Our Common Future") of 1987

### 3.2.1 Constitution of Kenya 2010

The constitution is the supreme law of the republic and binds all persons and all state organs at all levels of government. In relation to the environment, article 42 of chapter one, The Bill of Rights, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through, legislative measures, particularly those contemplated in Article 69 and have obligations relating

---

---

to the environment fulfillment under Article 70. Chapter 5 of the document provides the main pillars on which the 77 environmental statutes are hinged. Part 1 of the Chapter dwells on land, outlining the principles informing land policy, land clarification as well as land use and property. The second part of this chapter directs focus on the environment and natural resources it provides a clear outline of the state's obligations with respect to the environment. *The proposed project conformed to the constitution of Kenya 2010 which lays emphasis on a clean and a healthy environment. Irrigation projects utilize natural resources hence the need to develop an elaborate ESMP so as to contain adverse effects, [as has been developed here](#).*

### **3.2.2 Environmental management and coordination ACT (EMCA), Cap 387**

Part II of the Environmental Management and Coordination Act entitles every person in Kenya a clean and healthy environment. It seeks to safeguard and enhance sustainability of the environment. The act is a consolidation of the various sectoral laws on the environmental conservation, which had hitherto made it difficult to coordinate environmental protection. In the act are provided guidelines on issues of environment and stipulates offences and penalties for failure to adhere to the act. The proposed project has been researched, compiled and written in accordance with the Environmental Impact Assessment and Audit regulations, 2003, regulation 7(1) and the second schedule. It will be submitted to NEMA which has the overall responsibility of enforcing this act. The Act also lists the type of projects which must be subjected to the ESIA process. *The proponent appoints ESIA experts to conduct the EIA and produce a project report to comply with and meet the requirements of this legislation*

### **3.2.3 Water Act No. 43 of 2016**

The Act provides for the regulation, management, development and use of water resources, and water and sewerage services. It has provisions for formulation of five-year integrated water services strategy with plans, programs for protection, conservation, control and management of water resources; establishment of water sector institutions which include Water Resources Authority (in place of Water Resources Management Authority) to regulate water rights and works; the National Water Harvesting and Storage Authority (in place of National Water Conservation and Pipeline Corporation); the Water Services Regulatory Authority (in place of Water Services Regulatory Board); Water Works Development Agencies (in place of Water Services Boards); the Water Sector Trust Fund (in place of Water Services Trust Fund) to enhance water services; the Water Services Regulatory Authority to control water service providers, and the Water Tribunal (in place of Water Appeals Board) for dispute resolution.

*.Relevance*

*The proposed small scale irrigation scheme will have to adhere to the regulations in the water act. The act addresses issues on conservation of water, water abstraction rights and water harvesting and storage to satisfy crop production, human and livestock needs, and to protect ecosystems to secure ecologically sustainable development, including the responsibilities of county governments and public private partnerships.*

### **3.2.4 Water Quality Regulations, 2006, (Legal Notice No 121)**

Water Quality Regulations apply to water used for domestic, industrial, agricultural and recreational purposes; water used for fisheries and wildlife purposes and water used for any other purposes. No person is allowed to abstract water from a natural water body for irrigation purposes unless such water meets the standard set out in the Ninth Schedule (Annex 3) to these regulations.

These regulations provide for the protection of lakes, rivers, streams, springs, wells and other sources. The overriding objective of the regulations is to protect human health and environment. Proper enforcement of the regulations can lead to marked reduction in water borne diseases. The regulations provide guidelines and standards for the discharge of poisons, toxins, radioactive and

**Commented [ORM29]:** Please say the specific actions/ activities to be undertaken to comply with the provisions. For example, if a water permit is required, you can say that the project has already applied or obtained that permit. If a IWRUA is needed, say the proponent is a registered IWRUA, etc.

---

other pollutants into the aquatic environment. Standards have also been set for discharge of effluent into the sewer and aquatic environment, The National Environment Management Authority regulates discharge into the aquatic environment.

The regulations provide for creation of a buffer zone for irrigation schemes of at least fifty (50) meters in width between the irrigation scheme and the natural water body. The first and Ninth Schedule of the Regulations stipulates standards for sources of domestic water supply and irrigation water respectively. Persons (real or legal) discharging effluent into the environment are required to submit quarterly discharge monitoring records to NEMA. *The proponent will ensure that sources of water for Hewani Irrigation Scheme meet the specified standards provided in these regulations (see annex 3). The Ministry of Agriculture Livestock and Fisheries will liaise with WRA and NEMA to ensure farmers maintain the minimum 50 meters' buffer.*

**Commented [ORM30]:** How will the proponent ensure this?  
Be specific and avoid generics

**Commented [ORM31]:** This is specific ...

### 3.2.5 Water Resource Management Rules, 2007

The project will be required to submit authorization to the Water Resource Authority within 12 months of the commencement of the rules as stated in Part II Section 17(1). Failure to submit the documents may be used as basis for revocation, variation or cancellation of the permit or authorization.

Part VII Section 97 of the Rules states that the Authority shall, where applicable require an application to show evidence of compliance with provisions of EMCA, Section 99 states the need for controlling and measuring devices for accurate measurement of the water abstracted.

The WRM Rules 2007, Part VIII Section 104, states that the Authority shall be paid for water abstracted by any person in possession of a valid water permit or supposed to have a valid water permit. Section 107 states that the Authority may with good cause or at the request of the land owner demarcate the riparian boundary of any water course or body on any land at its own cost. Part IX of the WRM Rules, 2007 gives guidance on conservation of riparian land and catchment areas. Riparian area (according to the Rule Part 1) is land in respect of which management obligations are imposed on the owner by the authority due to its proximity to a water body. It does not imply change of ownership but imposes management for preservation of quality (and quantity) of the water resource. In the allocation of water for irrigation, the Authority shall give priority to substance irrigation; and be guided by crop water requirements in the area and the efficiency of water use. It also provides guidelines for establishment of a WRUA. For a WRUA to be considered for registration by the Authority, it should be legally registered, have a constitution conducive to collaborate management of water resources of a particular resource and which promote public participation, conflict mitigation, gender mainstreaming and environmental sustainability. Any WRUA that meets the prescribed conditions may seek to register with the Authority, by submitting the prescribed Form WRMA 018 set out in Twelfth Schedule. The Authority shall respond in writing within thirty days of the receipt of the application by the WRUA. Upon registration the Authority shall issue the WRUA with a certificate of registration.

The Authority may enter a Memorandum of Understanding with a WRUA for purpose of collaborative water resource management of the water resources.

*Water availability is the driving force behind any irrigation project. The main source of water in the proposed scheme is River Tana whose exploitation should be regulated to control amount of water used since there are users downstream at the Tana Delta. The proponent will undertake the initiative of promoting conservation of the riparian area along River Tana during project construction and operation*

**Commented [ORM32]:** Here you are saying the river is the source of water. In other instances, it is a borehole. Could please be clear about the source of water for irrigation for this project?

---

---

### 3.3 Irrigation policy and Regulatory framework

#### 3.3.1 National Irrigation and Drainage Development Policy

The policy seeks to stimulate irrigation development through targeted technical support effective co-ordination of the sector, institutional reforms, and the enactment of a comprehensive legal framework for irrigation development. It intends to guide, coordinate and harmonize sustainable sector development. The policy with its corresponding instruments anchors strategic interventions and legal safeguards, which in turn support and fast track policy implementation for the growth and sustainability of irrigation, drainage and water storage in Kenya. *The proponent will endeavor to promote the conservation and rehabilitation of the project area, and seek to improve the socio-economic conditions of the residents.*

Commented [ORM33]: How

#### 3.3.2 Irrigation Act (CAP 347)

This Act of parliament provides for the development, control and improvement of irrigation schemes 3(1), part II of the Acts grants legal establishment of the Ministry of Agriculture with the powers to sue and be sued and capable of purchasing or otherwise, acquiring, holding, managing and disposing of any property movable or immovable, entering into contracts and doing all things necessary for the proper performance of its duties and discharge of its functions under this Act and any subsidiary legislation made

The Act gives the Minister Powers to designate any area of land as a national irrigation scheme. Apart from irrigation carried out through designated irrigation schemes, private individuals engage in irrigated agriculture are required to apply for, and obtain a permit for water abstraction, following the permit application procedures that apply to abstraction for any other use. *The proponent will ensure compliance with the stipulated guidelines as provided for by the act in acquiring the relevant permits in regard to water abstraction.*

Commented [ORM34]: Which are those permits?

### 3.4 Environmental policy and Regulatory framework

#### National Environment Action Plan Framework, 2009 -2014

The National Environmental Action Plan Framework is the second national policy after the 1994 National Environmental Action Plan (NEAP). The development of NEAP is provided for by EMC (amendment) act 2015 which requires preparation of Environmental Action Plan at different levels; County, and national levels. The framework recognizes the intertwined linkages between economic growth and environment in Kenya. It highlights priority themes and activities for the country towards achieving sustainable environment. *The proponent shall ensure the proposed rehabilitation and expansion of Hewani solar small-scale irrigation scheme promotes sustainable environment.*

Commented [ORM35]: One may ask, what is sustainable environment?

#### 3.4.1 Environmental Management & Coordination Act Cap 387

This Act of parliament, EMCA 1999 and the subsequent amendments, is the parent Act of parliament that provides for the establishment of appropriate legal and institutional frameworks for the management of the environment and for matters connected therewith and incidental thereto. EMCA, in its 13 interrelated parts provide regulatory provisions for all levels of environmental conservation and management. The first one part provides legislative guidelines on administrative and planning components of the environmental management. They include; (I); General principles (II); Administration (III); Environmental planning (IV); Protection and Conservation of the environment. Part five and seven focus on field management of the environment as an integral component of actual or proposed projects. (V), Environmental Impact Assessments (EIA), audits and monitoring (VI); Environmental and Audit Monitoring (VII); Environmental quality standards. The last five parts of the act regulate on enforcement of provisions outlined in the Act and recognition of international agreements along which EMC (amendment) Act 2015 has been established. They are; (VIII); Environmental Restoration orders, Environmental Easements (IX); Inspections analysis and records (IX); International

Treaties, Conventions and Agreements (XI) National Environmental Tribunal (XII); Environmental Offences (XIII).

All chapters 1 to 13 apply to the project at one stage or the other and therefore the project proponent is required to understand and conform with the Act accordingly. One such are being environmental and social Impact assessment. This is expressly stated in section 58(2) of the Act. *The proponent of a project shall undertake or cause to be undertaken at his own expense an environmental social impact assessment study and prepare a report thereof where the authority, being satisfied after studying the project report under sub-section (1), that the intended project may or is likely to have a significant impact on the environment so directs.*

### 3.4.2 The Environmental (Impact Assessment and Audit) Regulations 2003

This is supplementary legislation to the EMC (amendment) Act. It gives additional punch by providing guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance on fundamental aspects in which emphasis must be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. The legislation further explains the legal consequences of partial or non-compliance to the provisions of the Act.

Irrigation infrastructure development is one of the activities listed on section 8E in the second schedule of Environmental Management and coordination (amendment) Act 2015 as among projects that require Environmental Impact Assessment before commencement. *The project cannot start before the license is granted upon conducting the ESIA. For this reason, this report provides the legal requirements for the project approval. Impacts of irrigation projects, involves major elements of the environment, including land, water, human health and safety.*

### 3.4.3 Environmental Management and Coordination (Conservation of biological diversity (BD) Regulations 2006

These regulations are described in Legal Notice No 160 of Kenya Gazette Supplement No. 84 of December 2006. These Regulations apply to conservation of biodiversity which includes conservation of threatened species, Inventory and monitoring of biological diversity and protection of environmentally significant areas, access to genetic resources benefit sharing, offences and penalties. This legislation takes cognizance of the need to promote integrity of biodiversity so as to promote their integrity. Most of the biological diversity is highly threatened by development in the current world and there is an apparent need to enhance their integrity. Section IV, prohibits any activity which may have adverse effects on the ecosystem. *The rehabilitation and expansion of the irrigation scheme may lead to an introduction of new crops that are not indigenous. There is need to promote these regulations so as to enhance the integrity of these biological diversity. The proponent will therefore seek to ensure and promote the management and conservation of biodiversity in the area by employing environmentally sound mechanisms during and after the establishment of the project.*

### 3.4.5 Environmental Management and Coordination (Wetlands, Riverbanks, Lakes Shores and Sea Shore Management) Regulations 2009

These regulations provide for the protection and management of wetlands, riverbanks, lakeshores and sea shore management and detail guidelines on the same. *The irrigation project when in operation will abstract water from River Tana resulting on increase and for water which may degrade the riparian areas. It is important that this legislation be enacted during the planning, construction and operation of the project.*

**Commented [ORM36]:** How has the project complied? You can say – “As required by the Act, the project was screened for environmental and social risks, and subsequently an environmental and social impact assessment was undertaken, and is the subject of this report. The report has outlined an ESMP. Further, stakeholders and the public have been consulted on the project and on this ESIA and their views taken into account”.

**Commented [ORM37]:** Mmmm... not sure what you are trying to say. But see the above suggestion for guidance on what should come here

**Commented [ORM38]:** Can you be sure about this? Which crops are targeted and are they alien to this location?

**Commented [ORM39]:** How do you promote the Regulations?

**Commented [ORM40]:** What are those environmentally sound mechanisms, can you name them?

**Commented [ORM41]:** Abstraction from Tana River and not a borehole in a Lutheran church. Please make this clear in the Introduction and Project Description

---

---

#### **3.4.6 Environmental Management and Coordination (Controlled Substances) Regulations 2007**

These Regulations aim to regulate the production, trade and use of controlled substances and products, provide for a system of data collection to facilitate compliance with relevant reporting requirements under the Montreal Protocol on Substances that deplete the Ozone Layer; promote the use of ozone friendly substances, products, equipment and technology; and ensure the elimination of substances and products that deplete the ozone layer. *The proponent will ensure that the wastes w produced in the irrigation scheme will be safely disposed in a way not to pose a threat to the ozone layer.*

#### **3.4.7 Environmental Management and Coordination (Water Quality) Regulations 2006**

Described in Legal Notice No 120 of Kenya Gazette Supplement No 68 of September 2006, these regulations apply to drinking water, water used for industrial purposes, agricultural purposes, recreational **purposes and wildlife and** any other purposes. The Regulations outline various water quality standards in relation to use and discharge.

Regulations 20 of these **regulation provide** for compliance with water quality standards for irrigation. It states that where the Minister, in exercise of his powers conferred under section 42(3) has issued an order for the management of natural water body, no person shall abstract water from such body for irrigational purposes unless such water meets the standards set out in the Ninth Schedule to these Regulations.

Regulations 21 of these regulations requires the creation of a buffer zone between an irrigation scheme and a natural water body and its states 'Any owner or operator of an irrigation scheme shall create a buffer zone of at least 50 meters in width between the irrigation scheme and the natural water body into which scheme discharges its waters'.

The regulations invest in the authority NEMA in consultation with WRMA, the powers to maintain water quality monitoring for sources of domestic water at least twice every calendar year and such monitoring records shall be in the prescribed form as stipulated out in the second schedule to these regulations. *The propose irrigation project will abstract water from Tana River. It is thus fundamental to conform the buffer zone specifications of at least 50meters and also regularly analyze water qualities and quantities at the intake points and check to prevent the discharge of toxic waste waters for conformity to stipulated irrigation standards in the supplementary legislation.*

#### **3.4.8 Environmental Management and Coordination (Waste Management) Regulations 2006**

Regulations guiding waste management are described in Legal Notice No 121 of Kenya Gazette Supplement No 69 of September 2006. They offer legal provisions on handling of a variety of wastes emanating from various projects and activities. The waste categories covered by the regulations include; Industrial Waste, Hazardous and toxic wastes; Pesticides and toxic substances; Biomedical wastes Environmental Management and Coordination (Controlled Substances) Regulations 2007; Radio-active substances. These Regulations outline requirements for handling, storing, transporting and treatment/disposal of all waste categories as provided therein. Part V section 34 requires that pesticides or toxic substances be disposed at designated site or plant approved by the authority. *The proposed project once operational will involve the use of pesticides and chemical fertilizers. Wastes resulting from the use of these products may contaminate River Tana and there should be strict observations of these regulations in dealing with all these wastes*

**Commented [ORM42]:** Do the proponent need a PMP?

---

---

### **3.4.9 Environmental Management and Coordination (Fossil Fuel Emission Control)**

#### **Regulations 2006**

These Regulations are described in Legal Notice No 131 of Kenya Gazette Supplement No 74 of October 2006 and will apply to all internal combustion engine emissions standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnership to control fossil fuel emissions. *The fossil fuels considered are petrol, diesel Kerosene. This will be applicable to equipment and machinery used in the project during constructing and operation phases of the project*

### **3.4.10 Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Regulations 2007**

This is covered under the legal notice number 61. These Regulations under part II section 3 prohibit making or causing any loud, unreasonable, unnecessary or unusual noise which annoys disturbs, injures or endangers the comfort, repose, health or safety of others and the environment

Section 4 prohibits excessive vibrations and excessive which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source

Operations of machineries that produce excessive noise are also prohibited under section II including: Operating or repair of any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air conditioning apparatus or similar mechanical device; or engaging in any commercial or industrial activity, which is likely to emit noise or excessive vibrations that exceed the levels prescribed in the First Schedule (See annex) to these Regulations

The legal notice also prohibit construction at night except for purposes specified in sub-Regulations (2) which include road and other public utilities. Section 15 calls for an EIA to be carried out by any person intending to carryout construction, demolition, mining or quarrying work to do an EIA studies to identify natural resources, land uses or activities which may be affected by noise or excessive vibrations from the construction, demolition mining or quarrying;

Determine the measures which are needed in the plans and specifications to minimize or eliminate adverse construction, demolition, mining or quarrying noise or vibrations impacts; and incorporate the needed abatement measures in the plans and specifications. *Under the regulation the contractor is prohibited from producing excessive noise and vibrations which may annoy, disturb, injure or endanger the comfort, response, health or safety of others and the environment or excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source. Under the regulations the contractor the will be required to undertake daily monitoring of the noise levels within the project area during construction period to ensure compliance.*

### **3.5.1 The land Act, 2012 (Legal Notice 6)**

This is an act of parliament to give effect to Article 68 of the constitution to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes. The Act applies to all land declared as: (a) public land under Article 62 of the constitution; (b) private land under Article 64 of the constitution; and (c) community land under article 63 of the constitution and any other written law relating to community land. The utilization of land resources under this category of land provided in the constitution, this act or any other written law is guided by the following values and principals of land management and administration including equitable access to land, security of land rights, sustainable and productive management of land resources, transparent and cost effective administration of land, Conservation and protection of ecologically sensitive

areas, elimination of gender discrimination in law, customs and practices related to land property inland. *The proposed Hewani Irrigation project is a central development activity that utilizes sensitive components of the land hence the need to adhere to the values and principals of Sustainable and productive management of land resources. Gender issues will be addressed by ensuring that women are given an opportunity in the management and use of the Irrigation scheme*

**Commented [JMA43]:** See comment regarding this on the Asako ESIA Report and adopt here to address.

### 3.5.2 County Government Act 2012

The act gives effect to Chapter Eleven of the Constitution, which provides the county governments the powers to function and take responsibilities for the delivery of services within their designated counties including management of environment and natural resources among other responsibilities. The functions provided for in Article 186 of the constitution as assigned in the Fourth Schedule of the Constitution. *This include management of natural resources, biodiversity, forests and water resources among others. The county government will therefore have responsibility in management of the proposed rehabilitation of the small irrigation scheme.*

**Commented [JMA44]:** See Asako ESIA and adopt the comment here. Present provision on public participation and how this has been complied with in the ESIA process and project as a whole.

### 3.5.3 The Community Land Act, 2016

The Act was enacted (pursuant to Article 63 (5) of the Kenya Constitution 2010 to provide for the recognition, protection and registration of community land rights; management and administration of community land; to provide for the role of county governments in relation to unregistered community land and for connected purposes. The Community Land Act (2016) also provides that the County governments shall hold in trust all unregistered community land on behalf of the communities. This provision does not however give the County Governments any authority to dispose of any Community Land. This part would be contradictory to the provision vesting the land with the Community and needs careful management. The County Government is simply expected to protect the Community Land against annexation while at the same time receiving financial compensation for any community land that may be taken out for infrastructure development or mining after adequate discussions and agreement by the respective community. *The proposed small scale irrigation development project, recognizes that for the community members to utilize their land effectively and sustainably, they must have ownership status of the land.*

**Commented [JMA45]:** Has this been complied with? How has this legislation informed the land acquisition process for this project?

## 3.6 Health Policy and regulatory framework

### 3.6.1 Occupational Health and Safety Act, 2007

The Act provides for the safety, health and welfare of workers and all persons lawfully present at work place, as well as the establishment of the National Council for Occupational Safety and Health and for connected purposes. Section 3(1) and (2) of the Act explains that it applies in all workplaces where any person is at work, either temporarily or permanently. It expounds on the purpose, which is to secure the safety, health and welfare of persons at work as well as protecting persons other than persons at work against risks resulting from, or connected to, activities at workplace. Further, sections 43 and 44 of part V give regulations on registration of work places. *The irrigation project will require significant manpower to drive and will thus result in employment of quite a number of people. There will also be need for designated workplace for operation.*

### 3.6.2 Public Health Act (Cap 242)

This Act makes provision for securing and maintaining health. Part III and IV of the Act focuses on notification, prevention and suppression of infectious diseases, including inspection, disinfection and provision of medical aid to affected parties in case of outbreaks of infectious diseases. Part IX regulates on sanitation and housing, granting health authorities powers to prevent or remedy any dangers to health arising from poor handling of sanitation issues as well



---

as improper housing and nuisances arising there from. Besides, regulations governing prevention and destruction of mosquitoes, encompassing due maintenance of yards, premises, wells, cesspits and identification and destruction of breeding places are entailed in part XII. Also disposal of wastes. *Sanitation and waste disposal, built structures, disease outbreaks and communal resource sharing are obvious issues in project during construction and implementation phase. The Public Health Act provides the necessary legal guidelines regulating measures aimed at effective control and management of the said issues is adhered to avoid break down of communicable and other diseases. During the commissioning phase there may be increased incidences of malaria due to large standing water mass hence the need to undertake capacity building on appropriate hygiene sanitation and provision of mosquito nets.*

### **3.6.3 Work Injury Benefits Act (WIBA), 2007**

The WIBA Act provides for compensation to employees for work related injuries and diseases contracted in the course of their employment in work places and for connected purposes.

Section 7(a) of the Act, on the obligations of the employer, requires an employer to obtain and maintain an insurance policy with an insurer approved by the State in respect of any liability that the employer may incur under this Act to any of his employees. Section 10(1) States that an employee who is involved in an accident resulting in the employee disablement or death is subject to the provisions of this Act, and entitled to the benefits provided for under this Act. It also states expressly that an employer is liable to pay compensation in accordance with the provisions of this Act to an employee injured while at work. On First Aid covered in section 45(1), an employer is supposed to provide and maintain such appliances and services for the rendering of first aid to his employees in case of any accident as may be prescribed in any other written law in respect of the trade or business in which the employer is engaged. *As workers are employed by the project contractors during the construction works, they may face myriad of challenges to their health, safety and security, either from the equipment of use or work processes. WIBA offers legal backing on the incidents or accidents at the workplace or while on duty, including First Aid and compensation aspects. It is thus important to integrate the relevant provisions of this Act in the proposed irrigation scheme development project activities by the contracting agency.*

### **3.6.4 HIV /AIDS Prevention and Control Act 2006 and Gender Mainstreaming:**

It creates public awareness on causes, modes of transmission, consequences and means of prevention and control of HIV and AIDS. It protects the rights of the infected and affected and outlaws' discrimination in all its forms against persons living with HIV and AIDS or those perceived or suspected to have HIV and AIDS. *It addresses the gender issues in sexual and reproductive rights which is the unequal social relations between men and women that give rise to gender inequalities in health. One of the key challenges identified is the inadequate integration of reproductive health and HIV and AIDS services. It proposes to ensure integration of HIV and AIDS information and services into reproductive health services at all levels and ensure adequate capacity for provision of the integration at all levels. The project is anticipating to create awareness on HIV/ AIDS and gender issues in all the stages of implementation.*

**Commented [JMA46]:** And also require that measures be put in place to guide actions: Awareness, VCT, condoms provision etc

### **3.6.5 The Sexual Offences Act, 2006**

This Act protects people and employees from any unwanted sexual attention or advances by staff members. This act ensures the safety of women, children and men from any sexual offences which include: rape, defilement, indecent acts. This law will govern the code of conduct of the Contractor's staff and provide repercussions of any wrong doing  
*Relevance.*

- 
- 
- ✓ *The ESMMP provides for the implementation of a SGBV action plan with an Accountability and Response Framework as part of the Construction-ESMP (C-ESMP) and administration of the whole project cycle*

### **3.6.6 Kenya National Youth Policy 2019**

The policy seeks to provide an opportunity for improving the quality of life for Kenyan youth through their participation in economic and democratic processes as well as in community and civic affairs. It also advocates for creation of a supportive social, cultural, economic and political environment that will empower the youth to be partners in national development.

#### *Relevance*

- ✓ *The proponent will ensure that the youth are involved in all phases of the project through participation, consultations management and during construction, operation and even decommissioning phases. The youth will also be given access to government procurement opportunities as per the public procurement authority act*

## **3.7 Institutional Framework**

### **3.7.1 The National Environmental Council**

The Act (EMCA) has established a public Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The committee has the mandate to investigate complaints relating to environmental damage and degradation. Its members include representatives from the Law Society of Kenya, NGO and the business community.

### **3.7.2 The National Environmental Management Authority**

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of the government in implementation of all policies relating to the environment

### **3.7.3 The Standards and Enforcement Review Committee**

In addition to NEMA, the Act provides for the establishment and enforcement of environmental quality standards to be set by a technical committee of NEMA known as the Standards and Enforcement Review Committee (SERC)

**Commented [ORM47]:** These are only relevant here if you can discuss their respective roles in this ESIA

## **3.8 World Bank Environmental safeguards**

### **3.8.1 OP/BP 4.01 (Environmental Assessment)**

The World Bank has well-established environmental assessment procedures, which apply to its lending activities and to the projects undertaken by borrowing countries, in order to ensure that development projects are sustainable and environmentally sound. Although its operational policies and requirements vary in certain respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study, which:

- Identifies and assesses potential risks and benefits based on proposed activities, relevant site features, consideration of natural/human environment, social and trans-boundary issues
- Compares environmental pros and cons of feasible alternatives
- Recommends measures to eliminate, offset, or reduce adverse environmental impacts to acceptable levels (siting, design, technology offsets)
- Proposes monitoring indicators to implement mitigation measures

- Describes institutional framework for environmental management and proposes relevant capacity building needs.

The World Bank considers environmental impact assessment (EIA) as one among a range of instruments for environmental assessment. Other instruments used by the World Bank include regional or sectoral environmental assessment, strategic environmental and social assessment (SESA), environmental audit, hazard or risk assessment, environmental management plan (EMP) and environmental and social management framework (ESMF). The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of environmental assessment. Proposed projects are classified into one of three categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts:

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental associated with Bank lending operations. The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable and that potentially affected people have been properly consulted. *The magnitude of the proposed project falls under category B.*

**Commented [ORM48]:** Please explain the relevance of this OP for this project. See suggestions on the ESIA Report for Asako Irrigation Project.

### 3.8.2 OP/BP 4.04 (Natural Habitats)

The policy is designed to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products, which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water area where most of the native plant and animal species are still present). *This project has no notable interaction with notable natural habitat apart from limited opening up of the site by cutting trees to allow for the expansion and rehabilitation of the irrigation project. After construction indigenous trees will be planted around the project area. A designated route direct to —the river Tana will be allocated for the wild angulates existing around the vicinity.*

**Commented [ORM49]:** Okay. Do we have species of flora and or fauna of biological significance in the area?

### 3.8.3 OP/BP 4.09 (Pests Management)

The policy is meant to minimize and manage the environmental and health risks associated with pesticides use and promote and support safe, effective and environmentally sound pest management. *This project will promote integrated pest management approaches which is mainly biodegradable in order to avert the use of pesticides and hazardous chemicals.*

**Commented [ORM50]:** If there will be significant use of agrochemicals, then there is need for a IPMP. Please advise the Proponent appropriately

### 3.8.4 OP/BP 4.10 (Indigenous Peoples)

This policy contributes to the Bank's mission of poverty and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies and cultures of indigenous peoples. For all projects that are proposed for Bank financing and affect indigenous peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The broad support of the project by the affected Indigenous Peoples such as Bank-financed projects includes;

- Preventive measures to adverse effects to the indigenous cultures and practices,
- Avoid potential adverse effects on the Indigenous Peoples' communities;
- When avoidance is not feasible, minimize, mitigate, or compensate for such effects.

Bank-financed projects are also designed to ensure that the Indigenous peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive. The objective of this policy is to design and implement projects in a way that fosters full respect for Indigenous Peoples' dignity human rights and cultural uniqueness and so that they receive culturally compatible social and economic benefits and do not suffer adverse effects during the development Process. Space intensive sub-projects such as solid waste dumping sites, wastewater disposal areas and commuter rail stations has a potential for disruption of indigenous people. Improved Social and economic systems across the metropolitan leads to potential intrusion to existing cultures.

*The project site is inhabited by the Pokomo community. It is a crop and livestock keeping area and the design takes full consideration of the inhabitants who are indigenous and will actually benefit directly since the irrigation facility will provide food crops and pasture water for both livestock and human*

**Commented [JMA51]:** Please confirm if this OP is triggered. i.e. has screening been made to determine whether the project beneficiaries are an IP community category.

**Commented [ORM52]:** Joe, is this sufficient?

### 3.8.5 OP/BP 4.11 (Physical Cultural Resources)

This policy is meant to assist in preserving physical cultural resources including the movable or immovable (above or below ground, or under water) objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance including sites and unique natural values. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices.

The objective of this policy is to avoid or mitigate adverse impacts on physical cultural resources from development projects.

- Identify Category A (any project involving significant excavations, demolition, movement of earth, flooding, or other environmental changes) and/or B (any project located in, or in the vicinity of, a physical cultural resources site) projects that fall under this OP policy
- Identify the likely physical cultural resources issues, if any, to be taken into account by the EA and develop the ToRs for the EA.
- If the project is likely to have adverse impacts on physical cultural resources, identify appropriate measures for avoiding or mitigating these impacts as part of the EA process. These measures may range from full site protection to selective mitigation, including salvage and documentation, in cases where a portion or all of the physical cultural resources may be lost.
- Develop a physical cultural resources management plan that includes measures for avoiding or mitigating any adverse impacts on physical cultural resources and provisions for managing chance find.

**Commented [ORM53]:** Either provide a Chance Finds procedure in the Annexes and refer to it here, or indicate that in case of chance finds, the Chance Finds Procedures outlined in KCSAP ESMF will be followed

### 3.8.6 OP/BP 4.12 (Involuntary Resettlement)

The policy states that "Where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. Resettlement plans should be built around a development strategy and package aimed at improving or at least restoring the economic base for those relocated. Experience indicates that cash compensation alone is normally inadequate. Voluntary settlement may form part of a resettlement plan, provided measures to address the special circumstances of involuntary resettles are included. Preference should be given to land-based resettlement strategies for people dislocated from agricultural settings. If suitable land is unavailable, non-land based strategies built around opportunities for employment or self-employment may be used".

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects. *The residents are actually farming within their homesteads and therefore there will be no involuntary resettlements. Construction of the irrigation scheme as a water harvesting structure will actually promote sustainable land management and utilization.*

**Commented [JMA54]:** Please confirm whether there will be laying of pipeline system to transmit irrigation water to individual farmlands? If the case what arrangements / consultations have been done to provide for access.

However, it is noted that the transmission pipelines will be laid over a distance of 750 metres. Please confirm if these will traverse land currently in use by individual members of the community.

**Commented [ORM55]:** Joe, comment on issues of economic displacement here, including issue of pipelines going through individual farmer fields

### 3.9 International Conventions

#### 3.9.0 Introduction

Kenya is a signatory to a number of conventions on sustainable development and is a member of various bilateral and multilateral organizations. This EIA study is also based on internationally respected procedures recommended by the World Bank in the World Bank Operational directives 4.01 and Environmental Source Book Volume II, which provides the relevant sectoral guidelines. Some of the relevant international treaties and conventions which are related to the project are mentioned in the subsequent items

#### 3.9.1 The World Commission on Environment (the Brundtland Commission of 1987)

The international policy recommends development that produces no lasting damage to the biosphere and to particular ecosystems. Economic sustainable development is the development for which progress towards environmental and social sustainability occurs within available financial resources: Kenya is ratified or acceded to numerous international treaties and conventions. Those that have implications on the project are described below

**Commented [ORM56]:** A Commission is not a Convention

#### 3.9.2 The Ramsar Convention on Wetlands of International Importance

Kenya ratified in June 1990. The Ramsar Convention on wetlands is primarily concerned with the conservation and management of wetlands. Parties to convention are also required to promote wise use of wetlands in their territories and to take measures for the conservation by establishing nature reserves in the wetlands, whether they are included in the Ramsar list or not. Wetlands are defined in the Ramsar convention as “areas of marsh, fen, peat or water, whether natural or artificial, permanent or temporary with water that is static or flowing fresh brackish or salty, including areas of marine water depth of which at tide does not exceed 6 meters.

The National wetland standing committee of Kenya’s Inter-Ministerial Committee on Environment (IMCE) defines wetlands as “areas of land that are permanently, seasonally or occasionally water logged with fresh saline, brackish or marine water, including both natural and man-made areas that support characteristic biota” while EMCA defines wet as “an area permanently or seasonally flooded by water plants and animals have become adapted. *The riverine vegetation along the river is a wildlife habitat area and due to the nature of the soils during rains stagnant water is common in lower areas. For this reason, the proposed irrigation project is expected to strictly observe the Ramsar Convention’s principles of wise use of wetlands in the project areas*

#### 3.9.3 Convention on Biological Diversity (CBD)

The CBD is one of the outcomes of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. The CBD establishes a global legally binding framework for the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of utilization of genetic resources. *The provisions of this convention should be taken into account in the conservation of various species of plants, animals and the variety of ecosystems in the project area by any development agency/sector/Government.*

---

---

### 3.9.4 Rio Declaration on Environment

The Rio Declaration on Environment and Development often shortened to Rio Declaration, was a short document produced at the 1992 United Nations “Conference on Environment and Development” (UNCED), informally known as the earth summit. The Rio declaration consisted of 27 principles intended to guide sustainable development around the world.

A few of the relevant principles include:

#### Principle 4: Environmental Protection in the Development Process

In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

#### Principle 10: Public Participation

Environmental issues are best handled with participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities including information on hazardous materials and activities in their communities and the opportunity to participate in decision making process, States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

#### Principle 22: Indigenous Peoples have a Vital Role

Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development

### 3.9.5 United Nations Framework Convention on Climate Change

The framework sets an ultimate objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (Human Induced) interference with the climate system. *Development projects in Kenya such as the proposed project are expected to take climate change considerations into account, to the extent possible, in their relevant social, economic and environmental policies and actions*

### 3.9.6 United Nations Convention to Combat Desertification 1994:

The convention addresses the problem of the degradation of the land by desertification and the impact of drought particularly in arid and semi -arid and dry semi-arid humid areas.

This convention is domesticated in EMCA 1999 via Section 46 where Sub County Environmental committees are required to identify areas that require re-forestation or afforestation as well as to mobilize locals to carry these activities. *The project area is in the lowlands zone under agro-climatic zone 5 and sub county environmental committees will mobilize the locals to undertake afforestation programmes along the river Tana along the catchment areas both upstream and downstream.*

### 3.9.7 Sustainable Development Goals

On September 25th 2015, countries adopted a set of goals to **end poverty, protect the planet, and ensure prosperity for all** as part of a new sustainable development agenda. Each of the 17 goals has specific targets to be achieved over the next 15 years. *The proposed irrigation project is aligned to the goals of SDGs 1, 2, 5,12,13,14 ending poverty, zero hunger, gender equality, clean water and sanitation, responsible consumption and production, climate action, life below water and life on land*

This section describes the project area's physical, biological and socio-economic environments. The project needs to put into consideration various environmental aspects as it shall make utility of environmental resources.

#### 4.0 Introduction

The Tana River catchment area comprises of the upper, middle and lower catchment areas. The upper catchment covers an area of 15,000 km<sup>2</sup> and extends to Kamburu dam which stands at around 1,000 m asl. About 70% of Kenya's hydropower is produced in the upper catchment. The middle catchment covers an area of 15,700 km<sup>2</sup> lying within altitudes of 1,000 and 200 m asl, while the area below 200 m asl covering an area of 95,300 km<sup>2</sup> makes up the lower catchment. The proposed Hewani Irrigation Scheme site falls in the lower catchment area

#### 4.1 Location and size

The proposed small-scale irrigation project is located on the coordinates; (S02° 14.363' E040°10.819'), Garsen North Ward, Salama Location of Garsen Division in Tana Delta Sub-County. This project is 4km South of Gamba town along the Gamba-Kitere murrum road. The Hewani Small Scale Irrigation Farm Community land is estimated to be around 135 acres. The net area being proposed for pilot development is 30 acres.

**Commented [ORM57]:** You had said this in the Intro. Remove to avoid unnecessary repetition

**Commented [JMA58]:** Specify here- Oh whose land is the 30 acres situated.



Figure 1 Map indicating the site of proposed Makere Ya Gwano Irrigation Scheme Courtesy of google earth

---

---

#### 4.2 Soils

To determine the soil texture, a [catwalk](#) was undertaken in and around the proposed irrigation facility. It was noted that the soil texture is uniform in the said area and the soil profile was indicative of moderately calcareous [soils](#). To determine the soil texture further below depth texture, a trial pit was dug to a depth of 1.2m deep. The soils are imperfectly drained deep to very deep, very dark greyish brown to olive brown, mottled firm to very firm, sandy clay to clay moderately calcareous and moderately saline and sodic throughout or in deeper subsoil (luvo-orthic SOLONETZ, saline phase and vertic LUVISOLS, saline-sodic phase

Commented [ORM59]: ? transect walk?

The soils are suitable for quite a wide range of horticultural crops and mainly vegetables such as tomatoes, kales, onions, chilies, capsicums, French beans, water melons, sweet melons. It is also suitable for cereal crops including maize, green grains and peas.

#### 4.3 Ecological and Climatic Conditions

The proposed project site is in Ecological Zones V-I and is within an altitude of about 40m above sea level. Rainfall is bimodal; with long rains expected in the months of April to May while the short rains are received in the months of October to November. Rainfall expected per year ranges between 450mm and 900mm. Temperatures are high all year round ranging from 27° and 30°. The zone is mainly used for irrigated agriculture, grazing fields for wildlife [and](#) livestock by pastoral communities.

#### 4.4 Vegetation Conditions

The proposed project area is dominated by complex ecosystem of high canopy riverine forests, wooded bush land and thickets as well as the grasslands. The species that are dominant in high canopy forest area along the riverine include *Chlorophora excelsa*, *Penicum spp*, *Manilkara zasibarensis*, *Brachilina brichantha*, *Terminalia spp*. Wooded bush is dominated by *Hyphaene coriacea*, *Terminalia spinosa*, *Digitaria milinjiana*, *Panicum infestum*. Grassland is dominated by *Echinochika spp*, *Sporobolus halvolus*, *Panicum spp*, *Cynodo dactylon*. In the dry lands dominant species include the *Acacia spp*, *Dobera glabla*, *Salvadora persica* and the invasive *Prosopis spp*.

Commented [ORM60]: Do we have species of conservation significance in the area that may be affected by the project? If so, what are the plans for their management?

#### 4.5 Demographic attributes

Hewani village is in Garsen North ward in Tana River Sub County. It is located in Wema sub location in Garsen Division. The sub location has a population of about 1,928 people, [comprising](#) 992 ~~are~~ males and 936 ~~are~~ females distributed in 390 households with approximately 6 people per household as per projections of 2019 K NBS census.

#### 4.6 Infrastructural access

Salama location has poor road infrastructure. The area particularly is accessible through the Gamba-Kitere murrum road. ~~the~~ [The](#) road is currently partly murrum and partly rough road.

The Location has electricity supply and is connected to the national grid. However, the main source of [energy](#) for cooking is fire wood. There is low utilization of other sources of energy like solar and wind. Telecommunication network is good. ~~–~~ Housing and shelter largely is traditional. A high proportion of people live in semi-permanent houses that seldom have access to essential basic services and infrastructure thereby leading to insecure and unsafe living [environment](#)[conditions](#). The most or notable infrastructure included a Hewani primary school, Hewani Secondary School, Hewani dispensary at Wema about 200m from Hewani Village, 3 boreholes, Church and Mosque.



---

---

#### 4.7 Land Ownership

The land is communally owned and will be subdivided into 0.2 acre per beneficiary to suit the type of irrigation. The committee has signed a land agreement to support the ownership. Appendix I. Therefore, no complication arises to where the infrastructure would be laid

**Commented [JMA61]:** The appendix refers to land for development of an Earth pan. Please clarify the inconsistency.

##### 4.7.1 Crop production

Among the crops cultivated include food crops (green grams, maize, Kunde, kales, water melon) and horticultural crops such as kales and tomatoes. The community relies on rainfed agriculture which has led to low crop production due to frequent rainfall failures. On marketing, most of the produce is sold locally in the nearby towns of Gamba, Idsowe and Garsen while some of it is sold in Hola and Malindi. Mobile traders, ~~in the area~~ are common in the area and they buy the produce ~~at~~ farm gate prices to be sold in major markets of Mwingi, Lamu and Garissa.

##### 4.7.2 Climate change effects

The evidence of climate change in the locality and the entire County has been observed in terms of increase in variability of erratic rainfall. The project area is communally owned where the community initially depending on TARDA main canal water supply, but, after its collapse (river course shifted 4km away), the community practiced rain-fed agriculture to meet its food requirements, and rainfall patterns are no longer predictable as they were in the past. The only viable option left with the community is solar powered drip irrigation which is climate friendly.

Climate change mitigation strategies which aim at reducing the emission of greenhouse gases (GHGs) from human induced activities need to be put in place. The strategies include: Solar energy, increase in ground cover by planting food crops, quality palatable pastures and fodder that will enhance carbon sinks and also provide high quality animal feeds.

---

---

## 5.0 Introduction

This chapter discusses the alternatives in the proposed Hewani Irrigation scheme in terms of zero option, alternative construction materials, alternative irrigation areas and the water source options

### 5.1 No Project Alternative

The “Zero option” represents a situation which would result if the project was not implemented. In that case, both the positive and negative impacts of construction and operation of the project will not occur. This option will however, involve several losses to the proponent and the country as a whole. The major impact of not proceeding would be the forfeiture of expected benefits. These include:

- Adequate water for irrigation purposes
- Increased crop and livestock productivity
- Enhanced Food and Nutrition Security
- Creation of employment
- Increased Livelihood resilience
- Enterprise development
- Local economic development

The economic status of the community and Kenya will remain unchanged; and the local skills would remain underutilized. From the analysis above, it is apparent that the No project alternative is no alternative to the community and the government of Kenya.

### 5.2 Alternative Project site

The proposed project location was selected based multiple factors which include:

- Project target area: The area was selected for implementation of irrigation scheme through Hewani Community based organization who applied for the KCSAP World Bank funded project. The previous mode of irrigation was canal based but the river Tana has changed cause since then
- Previous studies had indicated the suitability of the area for irrigation
- Existence of water resources from borehole water
- High agricultural production potential particularly high value crops

Alternative site would therefore have to bear similar characteristics. This would present a major challenge since most sites would not have all these characteristics.

### 5.3 Relocation Option

Relocation to a different site is an option available for the project implementation. At present the proponent does not have an alternative site. It means that the proponent in consultation with community has to look for the land. Looking for land to accommodate the scale and size of the project and carrying out required public participation may take about 6 months, although there is no guarantee that the land would be available. The proponent will take another 6 months to design and approvals since design and planning has to be according to site conditions.

**Commented [ORM62]:** Relocation and Alternative Project Site are, in my view, one and the same thing. Collapse into one

Project design and planning before the stage of implementation will cost the developer millions of Kenya Shillings. Whatever has been done and paid to date will be accounted as a loss to the proponent. Assuming the project will be given a positive response by the relevant authorities including NEMA and Tana River County, this project would have been delayed by over (1) year before implementation. This is a delay that the county economy cannot afford. This would also lead to a situation like NO project alternative option. The other consequence of this is that it would be a discouragement for the crop sector development stakeholders in their bid to address effects of climate change. In consideration of the above concerns and assessment of the current proposed site, relocation of the project is not a viable option.

**5.4 Analysis of Alternative Construction Materials and Technology**

The infrastructure for the proposed irrigation project will be constructed using modern locally and internationally accepted materials to achieve public health, safety security and environmental aesthetic requirements.

Equipment that conserves energy and water will be given first priority without compromising on cost or availability factors. They will be made using locally sourced stones, cement, metal bars fittings that meet the Kenya Bureau of Standards requirements. PVC pipes will be used to transport water from the solar pumped borehole to the site. Heavy use of timber during construction is discouraged because of destruction of forests.

The exotic species would be preferred to indigenous species in the construction where need will arise

**5.4.1 Irrigation Technology Option**

**a) Drip Irrigation**

Drip irrigation is an irrigation system in which water is delivered at the root of the plant, drop by drop. It is also known as trickle irrigation. The main advantage of drip irrigation is that it is the most water-efficient method of irrigation. The disadvantages are that it is the most expensive and least aesthetically pleasing method because of all the plastic lines which have to be installed close to each other on the ground.

**Table 4 Advantages of Drip Irrigation system**

<p><b>Benefits of Drip Irrigation systems</b></p> <ul style="list-style-type: none"> <li>✓ Minimized fertilizer/nutrient loss due to localized applications and reduced leaching</li> <li>✓ High water application efficiency</li> <li>✓ Levelling the field is not necessary</li> <li>✓ Ability to irrigate shaped fields</li> <li>✓ Allows safe use of recycled water</li> <li>✓ Moisture within the root zone can be maintained at field capacity</li> <li>✓ Soil type plays less important role in frequency of irrigation</li> <li>✓ Minimized soil erosion</li> </ul>	<ul style="list-style-type: none"> <li>✓ Minimized weed growth</li> <li>✓ Highly uniform distribution of water i.e. controlled by output of each nozzle</li> <li>✓ Lower labour cost</li> <li>✓ Variation in supply can be regulated by regulating the valves and drippers</li> <li>✓ Fertigation can easily be included with minimal waste of fertilizers</li> <li>✓ Foliage remains dry thus reducing risk of diseases</li> <li>✓ Usually operated at lower pressure than other types of pressurized irrigation, reducing energy costs</li> </ul>
---	---

**Limitations of drip irrigation**

- Expense; Initial cost can be more than overhead systems

- 
- Waste; the sun can affect the tubes used for drip irrigation, shortening their useable life.
  - Longevity is variable
  - Clogging; if water is not properly filtered and the equipment nor properly maintained, it can result in clogging
  - Drip irrigation might be unsatisfactory if herbicides or top dressed fertilizers need sprinkler irrigation for activation
  - Drip tape causes extra cleanup cost after harvest. You will need to plan for drip tape winding disposal, recycling or reuse.
  - Waste of water, time & harvest, if not installed properly. These systems require careful study of all the relevant factors like land topography, soil, water, crop and agro-climatic conditions and suitability of drip irrigation system and its components.
  - Germination Problems; In lighter soils subsurface drip may be unable to wet soil surface for germination
  - Requires careful consideration of the installation depth
  - Salinity; most drip systems are designed for high efficiency, meaning little or no leaching fraction. Without sufficient leaching, salts applied within the irrigation water may build up in the root zone, usually at the edge of the wetting pattern. On the other hand, drip irrigation avoids the high capillary potential or traditional surface-applied irrigation, which can draw salt deposits up from deposits below.

#### **b) Most suitable option for proposed project**

Based on the natural conditions (climate, soil infiltration, slope, water quantity, water availability), social conditions (expensive, labour, type of crop, level of technology) and environmental factors (water use efficiency, salinity control, pollution control) Drip irrigation presents the most suitable irrigation method for this project. The river Tana flows downstream all the way to the Indian Ocean. However, the river has change is course and it is now about 10 kilometers away from the community farm. The cost of pumping water from the borehole and directing to the irrigation fields is far much lower compared to getting water from the river Tana. Water will also be available throughout the year This will be clean and economical source of energy with minimal costs of only maintain the piping systems and solar

#### **c) Rain water harvesting**

This is feasible source of water for the proposed irrigation scheme since it has been adopted by other programs in the country. However due to the unreliability of the rainfall, it will not address the water needs of the farmers who require reliable water over a given period of time.

**Commented [ORM63]:** This is an alternative to what? Drip irrigation?

---

---

## CHAPTER SIX: PUBLIC CONSULTATIVE PROCESS AND DISCLOSURE

### 6.0 Introduction

The following section describes the consultations and public participation held to assess the opinions and attitude of the various stakeholders to the irrigation project. A participatory approach was adopted as an ongoing strategy throughout the entire project cycle. Public participation and consultations were done through individuals, groups and community meetings.

### 6.1 Objectives of the Public Consultations/meetings

The overall goal of the consultation process is to disseminate project information and to incorporate the views of the Project Affected Persons (PAPs) in the design of the mitigation measures and the management plan.

The specific aims of the consultation process were to: -

Improve project design and, thereby, minimize conflicts and delays in implementation;

- Facilitate the development of appropriate and acceptable entitlement options; Increase long term project sustainability and ownership.
- Reduce problems of institutional coordination.
- An important element in the process of impact assessment is consulting with stakeholders/community to gather the information needed to complete the assessment.

, and potential impact on project outcome that is the irrigation scheme project construction.

### 6.2 Participation Consultation/Interviews

The participant consultations were done on two levels, that is apart from the desk top studies from the various offices in the county and Sub County levels, community participatory meeting at the project site done at two levels that is Focused Group discussions (FGDs) and individual interviews on persons sampled among men, women and youth among the participants. Individual interviews done on prepared questionnaires to capture individual perception on the project (*Sample example of questionnaire attached as appendix*)

**Commented [ORM64]:** Desk studies can never be participant consultations. Please review this

**Commented [ORM65]:** Interviews and questionnaires do not in themselves constitute public participation

The methodology of the study entailed, site visits, public meetings and key informants' discussions. Three different meetings were held at the proposed site on 5<sup>th</sup> June 2021. A total number of 50 members of Hewani farmers' cooperative, area residents; and key stakeholders from government departments participated. Among the persons who attended the meeting were Vulnerable and Marginalized Groups (VMGs) especially women, youths and people living with disabilities. Consultations were done with key stakeholders and 15 questionnaires were randomly distributed to area residents and selected key government departments for filling. Minutes for these meetings are attached to this report

**Commented [ORM66]:** These are general methods used for this ESIA and not public participation and stakeholder consultations. Note that public participation and stakeholder consultations are also methods for collecting data for the ESIA

During some of the visits a field tour of the general area was undertaken and a detailed examination of the ecological setting of the area was carried out. Types of existing plant species and wild animals were recorded. The environmental condition existing in the proposed project area were documented to provide baseline data. The possible impacts of the proposed project activities were thereafter assessed against the documented baseline data. Section 35-2 of the environmental Impact Assessment and Audit Regulations 2003, requires that an EA should

---

*“examine and seek views on environment, health and safety issues from the local community and other potentially affected communities”*

### **6.2.1 Sources of Information**

During the environmental impact assessment, public participation was a key component in getting information to be incorporated in writing this report. Positive and negative views of the perceived affected neighbors were sought. The exercise was conducted by a team of registered environmental experts through administration of pre-designed questionnaires, and interviews in various areas surrounding the proposed project site

**Commented [ORM67]:** This is not relevant here. Here we just need a description of the public participation and stakeholder consultation methods – namely: public meetings, FDGs, questionnaires. You can append minutes and list of participants at the consultations.



*Plate 1: Lead expert consulting with community members of Hewani Village as they fill the individual questionnaire*



Plate 2: Lead Expert undertaking focused group discussion interview with some of the members

The neighboring communities were asked to comment and give views concerning the proposed project on various issues concerning the following:

- ❖ The positive impacts that may emanate from the development of the proposed project
- ❖ Measures that the developer should put in place during and after the project to mitigate impacts
- ❖ Whether the proposed project construction and occupation will cause the negative impacts on the following:
  - a) Local residents
  - b) Natural ecology of the area
  - c) The human environment
  - d) Public health and safety
  - e) Effects on the soil
  - f) Effect on areas of scenic beauty
  - g) Effect on plant species composition

Many respondents were consulted during public appraisal exercise although, some declined to give their contacts or real identification card numbers. However, their views have been incorporated in this project.

*The sub item below summarizes issues were raised and captured in the questionnaires from the community (respondents) towards the proposed irrigation scheme project and issues captured during the desktop studies analysis. The issues have been categorized as positive and negative issues (Selected Sampled filled questionnaires attached as appendix)*

### 6.2.2 Key issues arising from public participation meetings

Consultative meetings (baraza) with community in conjunction with the proponent and the administration. The list of attendants is presented in Appendix 1. The agenda of the meeting was to inform the community about the project and receive comments and suggestion from participants

The following is a summary of issues raised by members who attended the meetings

Commented [ORM68]: subsection

### 6.2.3 Perceived Benefits

- a) **Economic and social benefits** to the communities and contribute to the attainment of the National priority goals and ongoing National efforts to accelerate economic growth and alleviate poverty under the Food and Nutrition Security under Agenda 4
- b) **Enhanced food security and improved nutrition at the household level.** This will alleviate impact of erratic and unreliable rainfall pattern on the community's productive resources. Continuous supply and availability of food throughout the year.
- c) **Employment opportunities** will be offered to the construction workers and any other person who will be hired to provide her/his services during construction phase. In addition to direct employment, supplies of basic necessities to the workers will also lead to more employment opportunities and acquisition of entrepreneurial skills. This will engrain a sense of project ownership within the community
- d) **Reduction of idleness** amongst the youth due to an increase in income generating activities either directly or indirectly
- e) Incidences of abuse of drugs due to idleness will decline
- f) Ease the direct resource **dependency pressure on forest and wildlife resources**
- g) The project would ensure that greenhouse gas emission is reduced by using solar power to pump water
- h) Trees would also be planted in the project areas to act as carbon sink hence mitigating greenhouse gas effects to the environment
- i) The target crop during the first season would be dry maize and the expected yields per acre would be 15 bags (90Kg) per acre hence the scheme is expected to produce 450 bags which is 13,500 Kg of maize.
- j) Promote nutritional balance through integration of traditional high value crops such as amaranths vegetables and the yellow fleshed sweet potatoes that are highly rich in vitamin A hence reduced levels of malnutrition levels in the project area.
- k) **Using solar powered submersible pumps would curb greenhouse gas emission.**
- l) The **maize stalks that would be left after harvesting** would be used as livestock feeds hence improve on livestock production

### 6.2.4 Issues of concern

- a. The community expressed concern on **water distribution and rationalization** which does not reach the targeted community. The project management will put in place mechanism to enable all Hewani CBO community members to access water in compliance with regulations
- b. **Lack of marketing strategy infrastructure for product;** currently farmers do not have a crop storage and marketing plan. There is urgent need for scheme beneficiary farmers to develop collaborative and effective marketing strategies to access larger and more sustainable markets
- c. **Lack of adequate knowledge and skills in irrigation.** This could be attributed to limited knowledge and lack of irrigation crop production skills, tillage services, fertilizer, seed, integrated pest management and operations of irrigation equipment and management
- d. **Poor road infrastructure** that would hinder supply of farm produce to markets at Hola
- e. Clearing of vegetation during construction phase, this would be addressed through reforestation programs and sparing of indigenous trees during the expansion and clearing process
- f. **Lack of credit especially for irrigation purposes** to enable growing of high value crops and source inputs on time, and at competitive rates may hamper scheme productivity and adoption of climate smart agriculture techniques. The project beneficiaries through collective action can enhance access to financial service providers

**Commented [ORM69]:** which regulations? Those of the CBO or Water Regulations?

**Commented [ORM70]:** Is this what was suggested to address the concern? Make clear

**Commented [ORM71]:** What was suggested to address this concern?

**Commented [ORM72]:** As above



- 
- 
- g. **Human Wildlife conflict:** Some of the respondents felt that the proposed project would bring a problem of wildlife (herbivores particularly warthogs, antelopes, buffaloes or even elephants that are within the area) and livestock conflict due to passage to water animals at the river Tana.
  - h. **Accidents during Construction:** There is likelihood that during the construction phase of the proposed project, construction workers may get involved in accidents as a result of falling building stones/bricks, sharp metals and machines used in the construction. The proponent will strictly adhere to safe working practices to protect the workers, neighbors and passers-by
  - i. **Noise pollution:** There was concern over the possibility of high noise and vibration levels in the project site as a result of excavation and construction works. The sources of noise pollution will include transport vehicles, construction machinery and metal grilling and cutting equipment
  - j. **Risks of Contracting COVID-19** is likely to increase and therefore the community will have to be made aware and sensitize
  - k. **Concerns of engaging persons below the age of 18** was raised especially the issue of family labour in the irrigation plots. That child labour should be discouraged as much as possible
  - l. Both Women and men raised the issue of **gender based violence** especially in view of COVID -19. It was agreed that the project will keep households busy and hence lower incidences of violence in homes
  - m. Cases of Malaria may increase because of stagnant water in the irrigated fields. This will be addressed by provision of mosquito nets by the project management committee

Commented [ORM73]: As above

---

---

## **CHAPTER SEVEN: ANTICIPATED IMPACTS AND PROPOSED MITIGATION MEASURES**

### **7.0 Introduction**

This chapter presents the assessment of issues likely to arise as a result of the implementation of Hewani Irrigation project. The anticipated impacts are discussed in three phases namely construction, operational and decommissioning phases.

### **7.1 Impacts during Construction phase**

Construction phase shall begin with excavation in an area of about 30ha. Construction impacts have the potential to create nuisance to adjacent neighbors but these could be managed to acceptable limits. In addition, the construction impacts are also temporary in nature

#### **7.1.1 Anticipated Positive impacts during Construction phase**

##### **a) Employment opportunity**

The construction phase of the irrigation project will be characterized by recruitment of both skilled and unskilled laborers to work with contractor. The rise in population will create corresponding increase in demand for goods and services such as food for construction, workers, housing, health care and need for transport. These needs will be satisfied by people living within the project area where local women will provide food vending services, homes will rent out spaces for new population and shops will also benefit from increase of sales.

##### **b) Provision of Market for Supply of Building Materials**

The construction work will require supply of large quantities of building materials such as cement, timber, steel, among others most of which will be sourced locally.

#### **7.1.2 Anticipated Negative Environmental Impacts during Construction phase**

##### **a) Vegetation Loss**

Clearing of vegetation including grass, shrubs and trees is likely to occur during the laying of water conveyance and other development that involve excavation. This will be done along the riparian area and within the farms.

##### **Mitigation measures**

- Proper demarcation of construction areas to minimize trees to be felled
- Promote agroforestry during the operation phase to replace and enhance vegetation cover in the project area
- The contractor should ensure that vegetation is cleared only where necessary and if in the process mature trees are cut, new trees should be planted in areas adjacent to the cleared ones

##### **b) Increased soil erosion**

Excavation of soil for construction and laying of pipeline as well as are major activities during the construction phase of the project. They are bound to result in significant amounts of loose of residual soil, prone to erosion through surface water runoff, especially during rainy season

##### **Mitigation measures**

- Minimize exposed areas by properly demarcating the project area to be affected by the

- 
- 
- The contractor must establish implement drainage lines to avoid erosion in areas that are prone to erosion
  - Topsoil must be reinstated and rehabilitated on top of subsoil
  - All excavation works must be properly backfilled and compacted

**c) Air quality and dust emission**

Principal dust sources during construction will be generated during excavation works and possibly from project burrow pits, also during haulage of construction materials over distances. Gases from construction equipment and vehicles will also be emitted. The dust may cause respiratory complications to workers and nearby residents. Fumes and carbon compounds from the equipment and machines inhibit visibility and form deadly compounds in the air.

**Mitigation measures**

- Any stockpiles of earth (excavated), though little, should be enclosed or covered and watered during dry or windy conditions to reduce dust emissions
- Masks should be provided to all personnel in dust generation areas throughout the period of construction
- All equipment on site should be properly maintained in good operating condition so as to emit minimal air pollution
- Emission of gases from fuel combustions by machines can be reduced by use of e.g. exhaust systems that are in good working condition. This will significantly help in reducing the noise levels and the amount of destructive gases to atmosphere.
- Vehicles delivering soil materials should be covered to prevent dust emission

**d) Noise and vibration**

The construction works delivery of building materials by heavy trucks, blasting and use of machinery/equipment including bulldozers, generators, metal grinders and concrete mixers will contribute to high levels of noise and vibration within the construction site and the surrounding area. Such noise within the site can cause nuisance and disturbance to the project workers and the residents, passers-by and other persons in within the vicinity of project site

**Mitigation measures**

- People participating in the construction should be provided with Personal Protective Equipment (PPE) such as ear muffs for ear protection
- Sound-attenuated equipment should be used as much as possible
- No unnecessary hooting by project and resident vehicles
- Noise levels should be kept within acceptable limits preferably as stipulated within the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) Control Regulations 2009:
- Limit pickup trucks and other small equipment to an idling time, observe a common sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible;

**e) Increased Solid waste generation**

Large quantities of solid waste will be generated at the site during construction works. Such waste will consist cement, and gravel packs and other packets of materials and equipment metal

---

---

cuttings, rejected materials, surplus materials, surplus spoil, and excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among others.

**Mitigation Measures**

- The excavated material shall be recycled
- Minimize waste generated by adopting cleaner production methods e.g. conserving raw materials, enabling the recovery and reuse of waste product where possible
- Use durable long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time
- Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements of nature i.e. sunshine among others
- Containers or package for storing hazardous waste including used oil to be safely bundled and labelled as provided for by Regulation 18 under the Environmental Management Coordination (Waste Management) Regulations 2006 and the Public Health Act

**f) Oil spills**

The machines on site and vehicles contain moving parts which require continuous oiling to minimize the usual corrosion or wear and tear. Possibilities of such oils spilling and contaminating the soil and water on the site are possible. The potential for water contamination is likely and the effects are injurious to the aquatic life patterns and making drinking water unsafe for human consumption and domestic livestock

**Mitigation Measures**

- Vehicle maintenance should be done on purpose-built impervious concrete platforms with oil and grease traps
- Standard operating practices for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced
- All above surface tanks should be bounded and mounted on paved surfaces
- Ensure that all equipment is in good condition, clean and free from leaks
- Oil spill containment and clean up equipment should be safely kept by contractor

**g) Safety Health and Environmental (SHE) Concerns**

Every construction tool equipment and machines shall be well set adequately maintained. As well the construction area shall be kept free from objects such as sharps and tripping, which cause emergencies and occurrences of accidents ranging from minor cuts to fatalities during construction

*Recommended mitigation Measures*

- The construction site shall be adequately protected or fenced off from unauthorized intrusions and warning signs, barricades should be properly displayed and strictly adhered to.
- Provision of safe working area with adequate and well-equipped First Aid should always be maintained on site at all times during the whole period of construction

- 
- In addition to the proponent should ensure that the contractor adheres to rules set by authorities for protection of his workmen such provisions of insurance and protective gear
  - Adequately washing facilities should be provided for workers' hygiene and protection
  - Engage contractors who are fully conversant with occupational health and safety matters at workplace. As regards compliance by the contractor, the proponent on his part should ensure that all mitigation measures are strictly enforced through his site representative and his assurance should be firmly embodied in a signed contract document.

Information and education on operation and management of the facility, including all the environmental aspects should be offered to all the concerned for purposes of project responsibility, sustainability in terms of water quality and yields as well as safety

### **7.1.3 Anticipated Negative Social and health Impacts during Construction phase**

#### **a) Gender based violence and sexual harassment (GBV/SH)**

This impact is triggered during project construction phase when the contractor(s) fail to comply with the following provisions:

- ✓ Gender Inclusivity requirements in hiring of workers and entire project management as required by Gender Policy 2011 and 2/3 gender rule; and
- ✓ Failure to protect human risk areas associated with, disadvantaged groups, interfering with participation rights, and interfering with labour rights.

#### **The proposed Mitigation Measures of Human Rights and Gender Requirements are:**

- Ensure clear human resources policy against sexual harassment that is aligned with national law.
- Integrate provisions related to sexual harassment in the employee Code of Conduct.
- Ensure appointed human resources personnel to manage reports of sexual harassment according to policy.
- The contractor(s) shall require employees, sub-contractors, sub-consultants, and any personnel thereof engaged in construction works to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse.
- The contractor(s) will implement provisions that ensure that GBV at the community level is not triggered by the project, including:
- Effective and on-going community engagement and consultation, particularly with women and girls.
- Review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; etc.
- The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment.
- The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation.

#### **b) Sexual Exploitation and Abuse by project workers against community members**

- This impact refers to sexual exploitation and abuse (SEA) committed by project staff against communities and represents a risk at all stages of the project, especially when

---

---

employees and community members are not clear about prohibitions against SEA in the project.

**The proposed mitigation measures to risks of SEA include:**

- Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan will include how the project will ensure necessary steps are in place for:
- Prevention of SEA: including Code of Conducts and ongoing sensitization of staff on responsibilities related to the Code of Conducts and consequences of non-compliance; project-level IEC materials.
- Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
- Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights.

For GBV, SEA and COVID – 19 impacts adopt the recommended standard language below to replace the text in the report.

**Sexual Exploitation and Abuse (SEA)**

This impact refers to sexual exploitation and abuse committed by Project staff against community members and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project.

**Mitigation Measures to Risk of SEA**

✓ Develop and implement an SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018). The SEA action plan will include how the project will ensure necessary steps are in place for:

✓ Prevention of SEA: including COCs and ongoing sensitization of staff on responsibilities related to the COC and consequences of non-compliance; project-level IEC materials;

- 
- 
- ✓ Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;
  - ✓ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights;
  - ✓ Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

**a) Risk of Increased incidences of HIV/AIDS and STIs**

The influx of people may bring communicable diseases to the project area, including sexually transmitted infections (STIs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health facilities and resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

**Proposed mitigation measure for this are:**

- Contractor(s) to sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer. This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff.
- Controlled access to contractor's workforce camps by outsiders.
- Contractor(s) to provide standard quality condoms at the construction site during the construction period.

---

---

**b) Risks of increased spread of COVID-19 at work sites**

The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

**The proposed Mitigation Measures against spread of COVID-19 amongst workers are:**

- The contractor(s) shall put in place measures to prevent and manage the spread of the COVID-19.
- The contractor(s) will develop a SOPs for managing the spread of COVID-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions.
- Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel.
- The project shall put in place means to support rapid testing of suspected workers for COVID-19.
- Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid COVID-19 screening which may include temperature check and other vital signs.
- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used.

**Commented [JMA74]:** See recommended standard language below and adopt in place of the presented information.

**Spread of COVID-19 amongst workers at construction sites during construction**

During project execution (civil works), large numbers of workers will be required to assemble together in consultation engagements, meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of

**Commented [JMA75]:** Adopt this to replace above information.



workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community.

### **Covid Mitigation Measures**

The Contractors will develop SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;

#### Mitigation measures

- ✓ *Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors*
- ✓ *Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing of at least 2 meters*
- ✓ *All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening.*
- ✓ *The project shall put in place means to support rapid testing of suspected workers for covid-19;*
- ✓ *Install hand-washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;*
- ✓ *Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of work stations, door knobs, hand rails*

#### **Spread of COVID-19 amongst community members during consultations**

During consultations for ESIA, various activities will be undertaken. For efficient and meaningful engagement, a wide range of individual participants, groups in the local community and other stakeholders will be involved. The consultations will involve verification of PAPs covering the occupants of the affected area and vulnerable persons and groups; awareness raising, sensitization of PAPs and gauging attitude to the project; training and capacity building

Commented [JMA76]: Adopt this impact as well here

---

---

for livelihoods restoration grievance redress, execution of site - specific Surveys among others. The activities will lead to close interaction between the proponent and the community members leading to a high risk of spreading Covid-19 amongst community members during the consultation process. To minimize the social risk, measures will be required to ensure social distancing and appropriate communication measures. The mitigation measures will be supervised by a communications / stakeholder engagement / social safeguards expert in the project proponents' team.

**COVID-19 mitigation measures**

- i. Electronic means of consulting stakeholders and holding meetings shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;*
- ii. Avoid concentrating of more than 15 community members at one location. Where more than one person is gathered, maintain social distancing of at least 2 meters;*
- iii. The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;*
- iv. Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to provide and allow participants to provide feedback and suggestions.*
- v. Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration.*
- vi. In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups.*
- vii. Ensure online registration of participants, distribution*

•

Formatted: No bullets or numbering

---

---

**c) Risk of Increased incidences of HIV/AIDS and STIs**

The influx of people may bring communicable diseases to the project area, including sexually transmitted infections (STIs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health facilities and resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

**Proposed mitigation measures**

- Contractor(s) to sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan to be enforced by the Supervising Engineer. This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff.
- Controlled access to contractor's workforce camps by outsiders.
- Contractor(s) to provide standard quality condoms at the construction site during the construction period.

**d) Risks of increased spread of COVID-19 at work sites**

During project execution (civil works), large numbers of workers will be required to assemble together in meetings, toolbox talks and even at work sites; varied number of workforce including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots; and interaction of workers with the project host community will happen as workers find accommodation close to work sites, and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

**The proposed Mitigation Measures against spread of COVID-19 amongst workers are:**

- The contractor(s) shall put in place measures to prevent and manage the spread of the COVID-19.
- The contractor(s) will develop a SOPs for managing the spread of COVID-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilization. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions.
- Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel.
- The project shall put in place means to support rapid testing of suspected workers for COVID-19.
- Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing at least 2 meters. All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid COVID-19 screening which may include temperature check and other vital signs.

**Commented [JMA77]:** See recommended standard language and replace here

- 
- 
- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used.

**e) Child abuse**

Children within the project area will be exposed to risks associated with interaction between them and project workers. This includes child labour and sexual abuse which coherently leads to teenage pregnancies and exposure to communicable diseases such as HIV/AIDS.

**Mitigation measures**

- The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project.
- All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior.
- Children under the age of 18 years will not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.
- Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
- Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act, 2007 (Cap. 226) Part VII on protection of children against exploitation.

**f) Impacts related to occupational and public/community safety and health**

There are three main types of occupational health and safety hazards that may be of concern. These are physical, chemical and biological. Potential physical hazards will include noise and accidents. Chemical hazards will involve exposure to harmful gases and chemicals by inhalation, ingestion and skin contact. Biological hazards involve exposure to pathogenic organisms which may cause diseases. Specific areas of concern include: noise and vibrations, congestion, body contact, failure to observe social distancing thus exposing other people to COVID-19, poor sanitation, and accidents at the site. Poor sanitation could result from presence of potential environmental pollutants at the site including wastewater, decomposing solid wastes, dust and exhaust emissions. Accidents including cuts, pricks and bruises; electrocution from naked electrical cables; falling in uncovered holes and/or trenches and from raised places and suffocation from lack of oxygen in confined spaces. Accidents could result from lack of supervision and job training, improper handling of machinery and hand tools and inappropriate carrying out of tasks.

**Mitigation measures**

Mitigation options to some of the impacts have been discussed. Additional mitigation measures to other impacts are:

- Keep all passages clear at all times.
- Remove all soil, boulders, and other heavy materials from the edges of excavations.

- Fence the site for protection, privacy, reduction of trespass and theft, and control of entry by straying animals and therefore avoid conflicts between people at the site and the people in the neighborhood.
- Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others) at the site at all times.
- Put in place an appropriate emergency response plan including having emergency contacts (such as ambulance, fire tender and police) conspicuously displayed.
- Dispose wastes from the site regularly and ensure high standards of cleanliness of all waste collection and disposal facilities.
- Frequently undertake workers through refresher courses in order to make them have a basic understanding of the tasks under them, the hazards involved, and how to manage them.
- Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them to use them whenever they are in environments that warrant the use of such PPE especially in all situations where the body and skin are potentially exposed to hazards such as harmful dusts, sharp objects, burns and extreme temperature and/or when working in areas that present threatening experiences.

**g) Grievances/conflicts**

Common grievances expected to arise during the proposed project implementation include:

- ✓ Human and livestock interference with the project;
- ✓ Negative project impacts which may include disruption of income streams, physical harm, and nuisance from construction activities;
- ✓ Health and safety risks;
- ✓ Socially-unacceptable project staff relations with the communities and other stakeholders;
- ✓ Conflicts over water sources; and
- ✓ Pollution and other environmental related impacts.

**Mitigation measures**

The following are possible mitigation measures to manage grievances:

- Establish a grievance redress mechanism (GRM) for the proposed project;
- Seek to establish amicable relationships with stakeholders and manage the impact of the project activities on affected communities;
- Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising from project-related impacts and addressing them before they become grievances;
- Establish a grievance redress mechanism targeting communities and other project stakeholders but not applicable to commercial and employee-employee relationships, and which will allow stakeholders to easily put forth their concerns relating to the project, implementation and have them addressed in a prompt and respectful manner;

**Commented [JMA78]:** Present a GRM for this purpose!

- Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost;
- Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all, before, during and after construction of the proposed project.

#### **h) Social Evils**

This is the social impact expected from the proposed development during the construction stage. This will include for example an increase on the spread of STDs & AIDS, liquors drinking, drugs taking, prostitution etc. These are common anti-social vices at any construction site, which cannot be completely eradicated

##### **Mitigation measures**

- Sensitization of workers by the contractor in collaboration with stakeholders such as Ministry of Public Health
- Provision of social facilities such as HIV/AIDs counselling and testing center

**Commented [JMA79]:** How does this relate to this impact?

**Commented [JMA80]:** Present under HIV/AIDS Impacts

#### **i) Destruction of cultural heritage sites**

During construction, sites of cultural significance could be destroyed to pave way for infrastructure development. Such areas in the project include forest sites where religious and cultural practices are conducted. Destruction of such areas may erode the cultural heritage of the community and destroy community cohesion

##### **Mitigation measures**

- Proper identification and demarcation of sites of cultural heritage
- Establishing mechanisms for negotiation where disturbance of such sites is inevitable
- Protection of identified cultural sites

## **7.2 Operation Impacts during the Operation phase**

### **7.2.1 Positive Impacts**

#### **a) Employment Creation**

Through farming and sale of farm produce and indirectly through the provision of auxiliary services such as marketing, Banking, transport, communication among others

#### **b) Increased income level**

The expansion of irrigation scheme will lead to increased crop production and consequently increased household incomes.

#### **c) Increased productivity**

An increased in crop and livestock production which will enhance food security among households in the area. In addition, the increased production will sustain and support expansion of agro-based factories in the country

#### **d) Improved food security**

The project will increase food production by irrigation in the area and in the country at large. It will also improve the health status of the people and eliminate malnutrition problems that are prevalent in the area.

---

---

**e) Extended cropping seasons**

The community will have advantage of farming throughout the year compared to other farmers who rely on rain. This will increase their output and consequently their income.

**7.2.2 Negative Environmental Impacts during operation phase****a) Vegetation loss**

Clearance of vegetation in the farms may be done to allow for cultivation and this may lead to or aggravate soil erosion which eventually causes sedimentation in the River Tana. Cultivation of riverbanks without adequate conservation measures triggers intensive soil erosion and siltation in the river. Since the community also relies on fuel-wood as a source of energy the rate of de-vegetation might be aggravated as irrigation activities increase access to the buffer zone.

**Proposed Mitigation Measures**

- Strengthen the existing community based groups that promote conservation of trees through registration as Community Forest Associations
- Selective felling of trees according to the provisions of the county environment agency
- Creating synergies with farmers, government and non-governmental groups to enhance tree planting
- Institute appropriate conservation measures along the river banks

**b) Water pollution**

The proposed project may cause pollution of River Tana through deposition of organic and inorganic matter from the farms. Such pollution includes: sediment and particulate organic solids; Particulate bound nutrients, chemicals, and metals, such as phosphorous, organic nitrogen, apportion of metals applied with some organic wastes

Though insignificant in the area, the continued use of agrochemicals may cause non-point pollution to the existing water resources. This might have health implications on those who use the contaminated water. Water containing nutrients from fertilizers may cause eutrophication which causes death of fish and other aquatic biota. Farmers therefore need to be trained on safe use of agricultural chemicals and emphasis on integrated pest management

**Proposed Mitigation Measures**

- Sensitize farmers on sustainable agriculture practices such as proper use of agrochemicals, river bank conservation, agroforestry and soil conservation
- Educate farmers on Integrated Pest Management practices, dangers of pesticide contamination and conservation of water bodies
- Strengthen existing customary laws on conservation of rivers

**c) Salinization**

The introduction of large volumes of water into the soil in a continuous basis through irrigation is likely to change both the soil physical and chemical attributes. Inappropriate management of water e.g. through excessive irrigation and inadequate drainage will lead to water logging and leaching of water soluble nutrients to levels where they are no longer available for use of plants.

---

---

**Proposed Mitigation Measures**

- Provide adequate drainage within the farms
- Regular maintenance of the channels
- Regular monitoring and soil analysis to manage potential problems
- Sensitization of farmers on farm water management

**d) Water logging**

If proper land drainage is not practiced, irrigation has the potential of increasing soil salinity through raised water table and accumulation of soluble salts.

Water logging may occur because of poor levelling of pipes that leave water to stand in some sections of the field. The concentrated water from the irrigation outlets and malfunctioning of the pipes may also cause soil erosion and water logging especially water holding soils.

**Proposed Mitigation Measures**

- Capacity building of farmers on irrigation water management
- Construction and maintenance of adequate drainage system
- Apply water using appropriate irrigation methods
- Apply soil and water conservation methods on farms

**f) Solid waste disposal**

The solid waste will comprise mainly of agrochemical packaging materials, soil excavated and rock debris, metal cut offs plastics, cardboards, paper, wood and waste concrete among several others, which can cause water pollution and animal health risks.

**Proposed Mitigation Measures**

- Establish a waste disposal site for hazardous waste in a location approved by NEMA in accordance with the waste management regulations
- Sensitization of farmers on waste management
- Designate waste disposal sites/areas for agrochemical packaging
- Regular monitoring of waste management status in the farms

**e) Soil Erosion**

Different types of soil erosion are expected in the area including water erosion and gully. Continuous cultivation on cleared land without conservation measures, and animal tracks and uncontrolled grazing may cause loose soils that become susceptible to erosion. Intensified agricultural practices due to irrigation may accelerate soil erosion in the project area.

Out-of-date in fill water management practices involving poor cut and fill operations through watercourse embankments can result in soil erosion at the head end of the irrigated field and in sedimentation at the mid or tail-end locations of the field.

**Proposed Mitigation Measures**

- The design of farm irrigation systems will provide for conveying and distributing irrigation water without triggering soil erosion
- Provide free board in the design of the conveyance structures to protect them from floods and siltation



- Application of conservation treatments such as land levelling, irrigation water management, conservation tillage, and crop rotations to control irrigation-induced erosion
- Use cover crops to reduce soil displacement by water or wind

#### f) Sedimentation

Irrigation schemes can fail if sediment load of the water supply is higher than the capacity of the irrigation areas

The increase in erosion due to the economic activity prompted by the reservoir and its access roads needs to be taken into account

##### Proposed Mitigation Measures

- Sediment extraction of headwork's to be carried out regularly by the community members
- Provision of a sedimentation basin that will allow settlement of as much as possible sediment before getting into larger part of the system

#### g) Increase in Invasive species *Prosopis juliflora* (Mathenge)

The introduction of exotic species like *Prosopis Juliflora* may get rid of indigenous species or introduce disease agents which may affect plants, animals and/or man. Fertilizers and pesticides are widely applied to correct imbalances. These can percolate through the soil and/or be carried away in the drainage water polluting both groundwater and surface water especially in the downstream zone. The nutrients in fertilizers may give rise to eutrophication of surface water bodies and promote the growth of aquatic weeds. Pesticides residues are hazardous to health of both man and animals. The use of IPM will be promoted and enhanced

##### Proposed Mitigation Measures

- Cutting and uprooting the plant either manually or mechanically
- Clear the irrigation piping lines from plant growth
- The large trees of *Prosopis juliflora* can be used for fuel wood to generate income

#### h) Pests diseases and weed

Irrigated agriculture often provides improved conditions for crop diseases to develop particularly fungal and bacterial foliage diseases. This leads to increase in use of hazardous chemicals to aquatic systems and become rapidly concentrated in the food chain. Use of fertilizers result in eutrophication of the river Tana and may also affect health of the locals. Phosphates tend to be fixed to soil particles and therefore may reach the river when soil is eroded. Diseases and weeds spread rapidly through waste water and drainage water. Local variety of weeds may thrive in the irrigated environment and reduce agricultural productivity

##### Proposed Mitigation Measures

- Adopt integrated pest management control mechanism
- Training and awareness programmes on sustainable pest control
- Intensified extension services
- Use of linings, shade and intermittent drying out to complement traditional techniques of mechanical removal

**Commented [ORM81]:** If you foresee heavy use of agrochemicals then an IPMP is needed

---

---

### ***Conflicts between farmers and livestock keepers due to destruction of crops***

Conflicts may occur when livestock graze on cultivated land

#### **Proposed Mitigation Measures**

- Rules for grazing during the cultivation season should be formulated so as to minimize the destruction of crops by animals and to ensure amicable settlements of complaints over crop destruction
- Livestock should not be allowed to cause damage in the irrigated system
- Animal corridors to watering points should be provided within the scheme
- Conflicts should be managed by water committee, if they are beyond the capability of the committee, they should be referred to the local authority or line ministry (WRA, MoALF)

### **h)j) Increased waterborne diseases**

Polluted water is a major cause of human disease. The construction of irrigation might also lead to an increase in malaria incidences. Schistosomiasis is also a key disease caused by parasitic trematode worms which in their adult form live in the blood stream of human hosts. Aquatic weeds provide an important substrate for the snails. Poor sanitation and poorly constructed sanitary facilities in the fields may also lead to contamination of water bodies leading to the spread of diseases.

#### **Proposed Mitigation Measures**

- Provision of convenient and culturally acceptable sanitary facilities in the farm
- Proper construction of toilets to prevent infiltration
- Equip health centers with facilities and drugs
- Provision of treated nets to the targeted communities
- Sensitization of the community on prevention of waterborne diseases

### **h)k) Occupational health and Safety**

The use of pesticides, fertilizers and other agro chemicals may affect the farmers who handle them through inhalation or indirect skin contact. This may cause complicated health conditions. In addition, once they are washed into water bodies they may cause contamination and affect downstream users who draw water from the river.

#### **Proposed Mitigation measures**

- Ensure that trained first aid personnel are always available on site to handle emergencies.
- Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them to use them whenever they are in environments that warrant the use of such PPE especially in all situations where the body and skin are potentially exposed to hazards such as chemicals, harmful dusts, highly infectious wastes, sharp objects, burns and extreme temperature and/or when working in areas that present threatening experiences.
- Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others) at the site at all times.
- Put in place an appropriate emergency response plan including having emergency contacts (such as ambulance, fire tender and police) conspicuously displayed.

- 
- Frequently undertake workers through refresher courses in order to make them have a basic understanding of the tasks under them, the hazards involved, and how to manage them.

#### **m)) Moral decadence**

Since project will lead to an increase in income and raise living standards in the area, there is a likelihood of increased social vices such as prostitution theft, alcoholism among others.

#### **Mitigation Measures**

- Creation awareness on HIV/AIDs, social responsibility
- Strengthen existing structures that address social responsibility issues

### **7.2.3 Anticipated health and social impacts during operation phase**

#### **a) Health impact – creation of vector and rodents breeding grounds**

If the project commences with no well-designed water drainages, water may end up stagnating and hence creating conducive breeding areas for mosquitoes and other water based vectors leading to transmission of human diseases like malaria, Schistosomiasis and cholera. The water collection points themselves could become a potential breeding ground for mosquitoes if the circulation of water is not regular. Diseases such as malaria and bilharzia may be common place due to the proliferation of mosquitoes and bilharzia parasites. Poor bush management practices around the scheme may also lead to breeding grounds for mosquitoes.

#### **Proposed Mitigation measures**

- All hollow areas at the site should be filled with soil to prevent stagnation of water.
- The inlet and outlet pipes to the should be properly fixed to ensure regular flow of water which will prevent water from stagnating in the crop sites for a long time.
- Bushes and long grass around the designated irrigation scheme will be cleared to prevent breeding of mosquitoes.
- The CBO to facilitate provision of mosquito nets to communities residing within the irrigation scheme

#### **b) Social impact – risks of animals and people**

The entire area will be fenced and will be provided with a lockable gate. This will prevent entry of animals, children and unauthorized people into the designated areas or become hazardous areas where domestic animals and children may drown.

#### **Proposed Mitigation measures**

- ✓ Some sections in the irrigation areas will be fenced to keep off livestock, wildlife and unauthorized people
- ✓ Put warning signs at the irrigation areas to alert children and other people of the dangers associated with the potential cropping areas
- ✓ Carry out public awareness and education as a means against accidental deaths by drowning.

#### **c) Gender based violence and sexual harassment (GBV/SH)**

This impact is triggered during project operation phase when the Proponent or project management fail to comply with the following provisions:

Commented [JMA82]: See standard language and replace here

- 
- 
- ✓ Gender Inclusivity requirements in hiring of workers and entire project management as required by Gender Policy 2011 and 2/3 gender rule; and
  - ✓ Failure to protect human risk areas associated with, disadvantaged groups, interfering with participation rights, and interfering with labour rights.

**The proposed Mitigation Measures of Human Rights and Gender Requirements are:**

- Integrate provisions related to sexual harassment in the employee Code of Conduct.
- Ensure all employees and any personnel thereof engaged in the project implementation to individually sign and comply with a Code of Conduct with specific provisions on protection from sexual exploitation and abuse.
- Implement provisions that ensure that GBV at the community level is not triggered by the project, including:
  - i) Effective and on-going community engagement and consultation, particularly with women and girls.
  - ii) Review of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; etc.
    - Develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment.
    - Ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation.

**d) Sexual Exploitation and Abuse**

This impact refers to sexual exploitation and abuse (SEA) against communities and represents a risk at all stages of the project, especially when employees and community members are not clear about prohibitions against SEA in the project.

**The proposed mitigation measures to risks of SEA include:**

- Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).
- The SEA action plan will include how the project will ensure necessary steps are in place for:
  - i) Prevention of SEA: including Code of Conducts and ongoing sensitization of staff on responsibilities related to the Code of Conducts and consequences of non-compliance; project-level IEC materials.
  - ii) Response to SEA: including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management.
  - iii) Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights.

---

---

iv) Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers.

**e) Risk of Increased incidences of HIV/AIDS and STIs**

The influx of people may bring communicable diseases to the project area, including sexually transmitted infections (STIs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health facilities and resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

**Proposed mitigation measure for this are:**

- Sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan. This will involve periodic HIV/AIDS and other communicable diseases Awareness Workshops for Contractor's Staff.
- Controlled access to private offices and working places by outsiders.
- Provide standard quality condoms at the site at all times.

**f) Grievances/conflicts**

Common grievances expected to arise during the proposed project implementation include:

- ✓ Human and livestock interference with the project;
- ✓ Negative project impacts which may include disruption of income streams, physical harm, and nuisance from construction activities;
- ✓ Health and safety risks;
- ✓ Socially-unacceptable project staff relations with the communities and other stakeholders;
- ✓ Conflicts over water sources; and
- ✓ Pollution and other environmental related impacts.

**Mitigation measures**

The following are possible mitigation measures to manage grievances:

- Establish a grievance redress mechanism (GRM) for the proposed project;
- Seek to establish amicable relationships with stakeholders and manage the impact of the project activities on affected communities;
- Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising from project-related impacts and addressing them before they become grievances;
- Ensure the grievance redress mechanism is available to the affected community members and stakeholders at no cost;
- Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality of the parties to the mechanism and regardless of the complainants'

---

---

participation in this process, give a guarantee that the complainant's statutory rights to undertake legal proceedings remain unaffected; and

- Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all, before, during and after construction of the proposed project.

#### **g) Child abuse**

Children within the project area will be exposed to risks associated with interaction between them and project staff. This includes child labour and sexual abuse which coherently leads to teenage pregnancies and exposure to communicable diseases such as HIV/AIDS.

##### **Mitigation measures**

- The Proponent will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project.
- Children under the age of 18 years will not be hired at the site as provided by Child Rights Act (Amendment Bill) 2014.
- Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act, 2007 (Cap. 226) Part VII on protection of children against exploitation.

#### **h) Risk of increased spread of COVID-19**

During project operation, there will be a lot of interactions among different people at the site. The potential for the spread of any infectious disease like COVID-19 is high. There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment, and whether this will impact on local healthcare services including the project host community.

**Commented [JMA83]:** Adopt the recommended standard language

##### **The proposed Mitigation Measures against spread of COVID-19:**

- The CBO and County department of health will develop a SOPs for managing the spread of COVID-19 during project operation. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions.
- Mandatory provision and use of appropriate PPE shall be required for all project personnel.
- The project shall put in place means to support rapid testing of suspected workers for COVID-19.
- Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing at least 2 meters.
- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used.
- Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs.

#### **i) Impacts related to occupational and public/community safety and health**

---

---

There are three main types of occupational health and safety hazards that may be of concern. These are physical, chemical and biological. Potential physical hazards will include noise and accidents. Chemical hazards will involve exposure to harmful chemicals by inhalation, ingestion and skin contact. Biological hazards involve exposure to pathogenic organisms which may cause diseases. Specific areas of concern include: noise and vibrations, congestion, body contact, failure to observe social distancing thus exposing other people to COVID-19. Accidents including cuts, pricks and bruises, falling in uncovered holes and/or trenches and from raised places and suffocation from lack of oxygen in confined spaces.

### **Mitigation measures**

Mitigation options to some of the impacts have been discussed. Additional mitigation measures to other impacts are:

- Keep all passages clear at all times.
- Fence the site for protection, privacy, reduction of trespass and theft, and control of entry by straying animals and therefore avoid conflicts between people working in scheme and people in the neighborhood.
- Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with sterile adhesive bandages, safety pins, cleansing agent/soap, latex gloves; sterile gauze pads triangular bandages, non-prescription drugs, scissors, tweezers and antiseptic amongst others) at the site at all times.
- Dispose wastes from the site regularly and ensure high standards of cleanliness of all waste collection and disposal facilities.
- Frequently undertake workers through refresher courses in order to make them have a basic understanding of the tasks under them, the hazards involved, and how to manage them.
- Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them to use them whenever they are in environments that warrant the use of such PPE especially in all situations where the body and skin are potentially exposed to hazards such as chemicals, harmful dusts, highly infectious wastes, sharp objects, burns and extreme temperature and/or when working in areas that present threatening experiences.

### **7.3 Anticipated Impacts during the decommissioning phase**

Decommissioning refers to the formal process of removing something from the operational status. It requires time in order to properly deal with potential hazards and risks that may be encountered.

#### **7.3.1 Decommissioning activities**

A typical decommissioning involves water evacuation from the pipeline securing irrigation infrastructure, demobilization of irrigation systems, pumps and plant and disconnection from the solar powered mains, removal of unstable fills and configuration for long term drainage, which includes measures such as out-sloping, water-barring, ditch removal and a variety to other site specific solutions

The decommissioning exercise will have both positive and negative impacts.

---

---

### **7.3.2 Positive Decommissioning Impacts**

#### **Employment Creation**

For demolition to take place properly in good time, there will be need to employ people who will be involved in the demolition exercise for the proposed project on its decommissioning.

#### **Rehabilitation**

During the decommissioning stage rehabilitation works will be undertaken at the proposed scheme area to restore it to its original state. This will include replacement of topsoil and re-vegetation, which will enhance the aesthetic value of the area

### **7.3.3 Negative Decommissioning Impacts**

#### **a) Solid Wastes**

Some of the materials from the demolition shall be used in other construction sites as well as for landscaping activities on site while the remaining portions shall be disposed in accordance with the relevant National Environmental Laws and Regulations.

The solid waste resulting from demolition works will also be managed as follows;

- Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements
- Adequate collection and storage of waste on the site and safe transportation to the disposal sites and disposal methods at designed areas be provided



---

---

## CHAPTER EIGHT: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

The overall objective of the Environmental Management and Monitoring Plan (ESMMP) is to ensure that mitigation measures of identified adverse effects throughout the design, construction, operation and decommissioning phases are implemented and that they are effective so as to promote the positive effects. It will also enable response to new and developing issues of concern. The ESMMP is vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation.

### 8.1 Responsibilities

The ESMMP has various components with the respective stakeholders involved towards the implementation of the mitigation~~corrective~~ actions, various persons and organizations are to be involved in the project. The following should be involved in the implementation of the ESMMP: Project Proponent, Project Management Committee, the contractors, relevant government agencies and Hewani Community CBO

Commented [ORM84]: Corrective actions are for EAs

Commented [ORM85]: I thought this is the proponent?

### 8.2 ESMMP monitoring

There should be continuous monitoring and follow up on the project activities to ensure that the ESMMP is implemented and that its objectives are achieved. The implementing staff, the community, and the contractor should ensure that the mitigation measures are put in place as outlined in the ESMMP.

### 8.3 Design and Construction Phase

The necessary objectives activities, mitigation measures and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with construction phase of the proposed irrigation are outlined below:

**Table 5: Environmental, social management and monitoring plan during construction phase**

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
De-vegetation	<ul style="list-style-type: none"> <li>✓ Proper demarcation of construction sites to minimize disturbance</li> <li>✓ Strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works</li> <li>✓ As much as possible, avoid cutting down indigenous tree species of socio-economic importance</li> </ul>	<p><del>Demarcation of sites</del>  <a href="#">Areas demarcated for clearance</a></p> <p><a href="#">Cases of project vehicles outside demarcated routes</a></p> <p><del>Entire labour force</del></p>	<p>-Irrigation reports/photographs</p> <p>-Site plan showing demarcation</p>	<p>Contractor                      Environmental Management Committees                      WRUAs</p>	Throughout construction period	50,000
Soil erosion	<ul style="list-style-type: none"> <li>✓ The contractor should implement erosion control measures to avoid erosion in areas that are prone to erosion e.g. drainage lines</li> <li>✓ All excavation works must be properly backfilled and compacted</li> </ul>	<p>Construction sites demarcated</p> <p><del>All excavation backfilled</del>  <a href="#">Excavated areas backfilled</a></p>	-Site plan showing demarcations	Contractor WRUAs	Construction period	N/A
Air Pollution (dust exhaust)	<ul style="list-style-type: none"> <li>✓ Workers shall be trained on management of air pollution from vehicles and machinery</li> <li>✓ Vehicles delivering soil material should be covered to reduce dust emissions</li> <li>✓ Use of dust suppressants</li> <li>✓ Sensitization of workers on occupational health safety</li> </ul>	<p>-Workers/vehicle operators sensitized on reduced emissions</p> <p>-workers provided <a href="#">with PPE</a></p>	<p>-site visit /reports</p> <p>Photographs</p> <p>-Sensitization report</p>	Contractor	Construction	50,000

**Commented [ORM88]:** You need to be realistic. Are you sure the Environment Committee will camp at the site to implement these measures? Is that really their work and do they have the budget? I doubt. Usually, the responsibility during construction lies with the Contractor and his/her assigns. The contractor can however engage 3<sup>rd</sup> parties to implement certain measures it is him/ her that you can hold to account. Also, think of whether the identified responsible entity has the budget to implement the measure

**Commented [ORM86]:** These don't read as Indicators. An indicator is something that can be measured/ assessed

**Commented [ORM87]:** Besides not being an Indicator, it would not be relevant even it was re-phrased to read as Indicator

**Commented [ORM89]:** Which WRUA are we talking about here here?

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<ul style="list-style-type: none"> <li>✓ Workers provided with protective gear like helmets, dust masks, ear muffs when working.</li> <li>✓ Engines of vehicles and machinery not be left running.</li> <li>✓ Equipment on the site should be properly maintained so as to emit minimal air pollution</li> </ul>					
Noise Pollution	<ul style="list-style-type: none"> <li>✓ Workers should be provided with Personal Protective Equipment (PPE)</li> <li>✓ Use of PPE should be enforced</li> <li>✓ Sound –attenuated equipment should be used in as much as possible</li> <li>✓ Ensure use of equipment with exhaust systems in good working condition</li> <li>✓ Regular servicing of equipment</li> <li>✓ -Noise levels should be kept within acceptable limits</li> <li>✓ Limit pickup trucks and other small equipment to idling time</li> </ul>	<p>-PPE provided to workers Regular servicing of equipment</p> <p>No of cases reported relating to noise pollution</p>	Complaints register	Contractor	Construction Phase	N/A
Solid Waste management	<ul style="list-style-type: none"> <li>✓ Minimize waste generated</li> <li>✓ Recycling of the excavated material</li> <li>✓ Storage of construction waste in designed collection points</li> <li>✓ Appropriate waste disposal- directly/through licensed waste collectors</li> <li>✓ The disposal site need to be more</li> </ul>	<p>-Designed waste collection points established</p> <p>-Waste collection company engaged</p>	<p>-Waste storage points</p> <p>-Waste disposal facilities/contract collector</p>	<p>Contractor</p> <p>Community Environmental Management committees</p>	Construction	100,000

**Commented [ORM90]:** You can re-phrase as frequency of vehicle/ machine servicing. Then if you go the site, you can ask a sample of drivers/ operators how often they service the vehicles and whether they think that frequency is adequate. You could also review servicing schedules against those recommended by the manufacturing. This is just to give you a tip

**Commented [ORM91]:** This a good Indicator. Cascade throughout the ESMP

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	that 100 meters from water course and in apposition that will facilitate prevention of storm water run-off from the site from entering the water courses					
Oil spills	<ul style="list-style-type: none"> <li>✓ Vehicle maintenance should be done on purpose built</li> <li>✓ Impervious concrete platforms with oil and grease traps.</li> <li>✓ Standard operating practices for re-fueling mobile equipment such as a minimum 15m from any water channel should be practiced</li> </ul>	Oil and grease traps established	Soil tests	Contractor	Construction phase	50,000
Occupational health and safety	<ul style="list-style-type: none"> <li>✓ Availability of adequate and appropriate sanitary facilities</li> <li>✓ Ensure workers health and safety throughout the campaign</li> <li>✓ Train at least one employee on first aid skills</li> <li>✓ Have fire extinguishers and train workers on how to use them</li> <li>✓ Have dust suppressants to reduce dust</li> </ul>	<p>Latrines provided</p> <p>Recorded accidents occurrences and near misses</p> <p>OSH sensitization conducted</p>	Safety records	Contractor	Construction	200,000
<b>Anticipated Health and Social Impacts</b>						
Covid 19	<ul style="list-style-type: none"> <li>✓ Follow control protocol like use of face mask, social distance, sanitizing, hand washing</li> </ul>	Number of incidences reported	Reports	Contractor, County department of Health	Throughout	100,000

**Commented [JMA92]:** See standard language below this table and adopt

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Gender based violence and sexual harassment (GBV/SH)	<ul style="list-style-type: none"> <li>✓ Implement provisions that ensure that GBV at the community level is not triggered by the project, including:</li> <li>✓ Sensitization, community engagement and consultation, particularly with women and girls.</li> <li>✓ Ensure adequate referral mechanisms are in place if a case of GBV at the community level</li> </ul>	<ul style="list-style-type: none"> <li>Number of recorded cases of GBV</li> <li>Number of sensitization workshops</li> </ul>	Reports	Contractor, HEWANI CBO County department of social services	Continuous	50,000
Sexual Exploitation and Abuse by project workers	<ul style="list-style-type: none"> <li>✓ Develop and implement a SEA action plan</li> <li>✓ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM;</li> </ul>	<ul style="list-style-type: none"> <li>Number of recorded cases</li> <li>Number of sensitization workshops</li> <li>Number of persons by gender sensitized</li> </ul>	Reports	Contractor, HEWANI CBO County department of social services	Continuous	20,000
Risk of Increased incidences of HIV/AIDS and STIs	<ul style="list-style-type: none"> <li>✓ Contractor(s) to sensitize workers and community members on HIV/AIDS awareness and other communicable diseases as part of the contractor's Health and Safety Management Plan</li> <li>✓ Contractor(s) to provide standard quality condoms at the construction site during the construction period.</li> </ul>	<ul style="list-style-type: none"> <li>Number of persons by gender sensitized</li> <li>Cartons of condoms distributed and to the relevant persons</li> <li>Number of sensitization workshops</li> </ul>	Reports	Contractor, HEWANI CBO County department of social services	Continuous	20,000

**Commented [ORM94]:** This is way to make this specific

**Commented [JMA93]:** Adopt standard language below this table

**Commented [JMA95]:** As above

**Commented [ORM96]:** Just as an example. The County Department of Health can deliver this with the facilitation of the Contractor. However, it is the Contractor that the Proponent can hold accountable unless of course the budget is provided to the Department of Health

<b>Expected Negative Impacts</b>	<b>Recommended Mitigation Measures</b>	<b>Performance Monitoring Indicator</b>	<b>Means of Verification</b>	<b>Responsibility Monitoring Implementation</b>	<b>Time Frame</b>	<b>Cost</b>
Child abuse	<ul style="list-style-type: none"> <li>✓ Comply with all relevant local legislation, including labour laws in relation to child labour</li> <li>✓ Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage,</li> </ul>	Number and type of child abuse incidences reported	<p>Reports</p> <p>Existing records at the Children centers</p>	Contractor, HEWANI CBO County department of social services	Biannually	-
Impacts related to occupational and public/community safety and health	<ul style="list-style-type: none"> <li>✓ Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with all the necessary accessories) at the site at all times</li> <li>✓ Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site and sensitize them</li> </ul>	<p>Number of Fully equipped first Aid Kits available</p> <p>Number of reported accidents</p>	Reports	Contractor, HEWANI CBO County department of social services, County department of public health	Continuous	20,000
Grievances/conflicts	<ul style="list-style-type: none"> <li>✓ Establish a grievance redress mechanism targeting communities and other project stakeholders but not applicable to commercial and employee-employee relationships</li> <li>✓ Ensure the grievance redress mechanism is available to the</li> </ul>	<p>Number of reported cases on grievances</p> <p>Number of sensitization awareness creation workshops on GRM</p> <p>Number of community members</p>	<p>Reports</p> <p>Existing records</p>	Contractor, HEWANI CBO County department of social services,	Continuous	20,000

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<p>affected community members and stakeholders at no cost</p> <ul style="list-style-type: none"> <li>✓ Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality of the parties to the mechanism and regardless of the complainants'</li> <li>✓ Educate all project stakeholders on the availability and use of the grievance redress mechanism in a manner that is understandable to all,</li> </ul>	trained on GRM				
Destruction of cultural heritage sites	<ul style="list-style-type: none"> <li>✓ Proper identification and demarcation of sites of cultural heritage</li> <li>✓ Establishing mechanisms for negotiation where disturbance of such sites is inevitable</li> <li>✓ Protection of identified cultural sites</li> </ul>	<p>Affected cultural sites in the project area</p> <p>Number of mechanisms/meetings undertaken</p>	<p>Reports</p> <p>Photos</p> <p>Existing records at the county government office</p>	<p>National Museums of Kenya</p> <p>County department of Cultural services</p> <p>Contractor</p>	Construction period	-
<b>Sub Total:</b>	<b>ESMMP Construction phase</b>					<b>680,000</b>

**Commented [ORM97]:** This is okay, since in case of chance find the contractor will secure the area and notify the NMK and County Department of Culture

#### 8.4 Environmental Social, Management and monitoring plan during operation phase

The environmental management and monitoring plan for the operational phase provides specific guidance related to the operational activities associated with the irrigation project. It is centered on sound environmental management practices that will be undertaken to minimize adverse impacts on the environment through normal operations of irrigated agriculture. The plan further identifies measures to be taken in an event of emergencies or incidences during the operation of the scheme. The table below shows operation phase of the irrigation project

#### OPERATION PHASE

Table 6: Environmental Social Management and Monitoring plan for operation phase

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
<b>Water pollution</b>	-Sensitize farmers on sustainable agricultural practices, river bank conservation, agroforestry, soil conservation -Educate on integrated pest management dangers of contaminating the river with synthetic fertilizers -Regular water monitoring	-Soil conservation measures -Trees plant along with crop -Farmers practicing IPM - Regular water quality data from WRMA	-Training reports/photographs  -Field observations on number of trees planting along with crop production  -Minutes of community meetings	KCSAP, WRMA, Hewani Community CBO  Sub County Government Agriculture Office in Tana River	Throughout operation period	100,000
<b>Sedimentation</b>	-Sediment extraction at head works be carried out regularly	-amount sediment in the basin	-Low sediment levels in the larger part of the land area	County Government Agriculture Office in Tana River Hewani Community CBO	Throughout operation period	
<b>Salinization</b>	-Provide adequate drainage within	-Regular monitoring	-Reports on the	County Government	Throughout	150,000

**Commented [ORM98]:** This is a bit general – You make it by saying No and types of conservation measures adopted by beneficiaries or proportion of beneficiaries adopting soil and conservation measures

**Commented [ORM99]:** Integrated pest management?

**Commented [ORM100]:** Okay

**Commented [ORM101]:** Think how you will measure this



Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	the farms	of soil analysis to manage potential problems	salinity levels of the soil samples	Agriculture Office in Tana River WARMA	operation period	
<b>Water logging</b>	Construction and maintenance of adequate piping system Apply soil and water conservation methods on farms Apply suitable irrigation methods	Piping systems properly maintained Conservation methods applied Irrigation methods monitored	Report on status of drainage systems Report on conservation methods being applied in the farms	County Government Agriculture Office in Tana River Community members Hewani Community (CBO)	Throughout operation period	N/A
<b>Solid Waste management</b>	-Establish waste disposal site for hazardous waste in allocation approved by NEMA in accordance with waste management regulations --Designed waste collection points established -The disposal site need to be more than 100 meters from water course and in apposition that will facilitate prevention of storm water run-off from the site from entering the water courses	Regular monitoring of waste management status in the farms  - Storage of construction waste in designed collection points	-Number of Waste storage points  -Number Waste disposal facilities/contract collector	County government of Tana river Community members WARMA	Throughout operation period	250,000
<b>Soil Erosion</b>	-Provide free board in the design of the conveyance structures to protect them from floods and siltation -Use of cover crops to reduce soil displacement by water -Design irrigation system will provide for conveying and distributing irrigation water without triggering soil erosion	Design of farm irrigation systems conducted  Cover crops used to reduced water displacement	Report on the conveyance structures established	KCSAP project Community members  Community forest Association Water Resource User Association	Operation period	25,000
<b>Pest, disease and</b>	-Training and awareness	No of persons	Reports	KCSAP project team	Operation period	200,000

**Commented [ORM102]:** The measure is provision of adequate drainage and this Indicator here is not relevant to it. A more relevant would be No and type of drainage structures provided. Again this is a tip on how to improve the Indicators

<b>Expected Negative Impacts</b>	<b>Recommended Mitigation Measures</b>	<b>Performance Monitoring Indicator</b>	<b>Means of Verification</b>	<b>Responsibility Monitoring Implementation</b>	<b>Time Frame</b>	<b>Cost</b>
<b>weeds</b>	programmes on sustainable pest control -Adopt integrated pest management control mechanisms -Intensified extension services	trained  IPM mechanism adopted Extension services provided/intensified	Photographs	Tana River County Government Department of Agriculture  WRUA members		
<b>Conflicts</b>	-Build capacity of local conflict resolution mechanisms  -Conflict among beneficiaries over water access and distribution within the scheme  -Conflict among beneficiaries over allocation of the operations and maintenance costs	Capacities on conflict resolution built  Ensure beneficiary participation and community management  Water committee be established responsible for resource mobilization	Number of farming communities trained on conflict resolution  Number of beneficiaries targeted  Water Committee established and functional	WRUA members  Tana River County Agricultural office  Community members KCSAP project implementation team County Agricultural Office  WRMA, WRUA, Tana River county Agricultural office	Operation period  Operation period  Operation period	50,000
<b>Water borne diseases</b>	-Provision of treated nets to the targeted communities -Equip health centers with drugs  -Provision of water treatment tablets	Mosquito nets provided Health centers equipped Water treatment tablets provided Communities sensitized	Number of targeted households provided with Mosquito nets, Water treatment tablets and sensitized	County Government in charge of Health services  Hewani CBO team County Director NEMA	Operation period	

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
<b>Occupational Health Safety</b>	All health risks equipment must be cleared from the project site  Adopt integrated pest and disease control	Health risk equipment cleared  Integrated pest and disease control adopted	Number of health risk equipment cleared  Report on activities adopted on integrated pest and diseases control	County Government in charge of Health services  Tana River county Agricultural office	Operation period	
<b>Moral Decadence</b>	-Create awareness on HIV/AIDs, social responsibility -Strengthen existing structures that address social responsibility	Awareness on HIV/AIDs social responsibility created	Reports Social platforms established No of Barazas/ Meetings	County Government in charge of Health services  Tana River county Agricultural office	Throughout the project period	10,000
<b>Covid 19</b>	Follow control protocol like use of face mask, social distance, sanitizing, hand washing	Number of incidences reported	Reports	Hewani Community CBO	Throughout	100,000
<b>Anticipated Health and Social Impacts</b>						

**Commented [JMA103]:** Adopt the recommended standard language

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Creation of vector and rodents breeding grounds	<ul style="list-style-type: none"> <li>✓ Bushes and long grass around the designated irrigation scheme will be cleared to prevent breeding of mosquitoes.</li> <li>✓ The CBO to facilitate provision of mosquito nets to communities residing within the irrigation scheme</li> </ul>	<p>Acreage of bushes in the irrigation area cleared</p> <p>Number of households facilitated with mosquito nets</p>	<p>Reports</p> <p>Photos</p>	HEWANI CBO County department of Water/Irrigation County department of public health	Continuous	50,000
Social impact – risks of animals and people encroaching the irrigated farms	<ul style="list-style-type: none"> <li>✓ The irrigation areas will be fenced</li> <li>✓ Put warning signs at the irrigation areas to alert children and other people</li> <li>✓ Carry out public awareness and education.</li> </ul>	<p>Length of fencing wire</p> <p>Number and specific sites where warning signs are placed</p> <p>Number of public awareness meetings</p>	<p>Reports</p> <p>Photos</p>	HEWANI CBO County department of Water/Irrigation County department of public health	Continuous	200,000
Gender based violence and sexual harassment (GBV/SH)	<ul style="list-style-type: none"> <li>✓ Effective and on-going community engagement and consultation, particularly with women and girls.</li> <li>✓ Develop specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to compensation and employment.</li> <li>✓ Ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation</li> </ul>	<p>Number of GBV reported incidences</p> <p>Number of awareness, creation, consultative workshop/meetings</p>	Reports	HEWANI CBO County department of Social services County department of Children's Gender based violence expert	Continuous	20,000
Sexual Exploitation and Abuse	<ul style="list-style-type: none"> <li>✓ Develop and implement a SEA action plan with an</li> </ul>	Number of SEA reported incidences	Reports	HEWANI CBO County department of	Continuous	-

Commented [JMA104]: Adopt standard language

Commented [JMA105]: See standard language and adopt

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<p>Accountability and Response Framework as part of the C-ESMP.</p> <p>✓ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities;</p>	<p>Number of awareness , creation, consultative workshop/meetings</p>		<p>Social services Gender based violence expert</p>		

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
Risk of Increased incidences of HIV/AIDS and STIs	<ul style="list-style-type: none"> <li>✓ Sensitize workers and community members on HIV/AIDS awareness and other communicable diseases to be instituted and implemented as part of the contractor's Health and Safety Management Plan,</li> </ul>	<p>Number of awareness, creation, consultative workshop/meetings</p> <p>Number of condoms distributed</p>	Reports	HEWANI CBO County department of Social services and County Public Health department	Continuous	-
Grievances/conflicts	<ul style="list-style-type: none"> <li>✓ Put in place a pre-emptive community liaison structure aimed at identifying potential issues arising before they become grievances;</li> <li>✓ Ensure the grievance redress mechanism is available to the affected persons at no cost;</li> <li>✓ Address all raised grievances, real or imagined and take reasonable steps to maintain confidentiality of the parties to the mechanism and regardless of the complainants'</li> </ul>	<p>Number of conflict related cases reported and addressed</p> <p>Number of awareness creation workshops/meetings</p>	Reports	HEWANI CBO County department of Social services	Continuous	10,000
Child Abuse	<ul style="list-style-type: none"> <li>✓ Develop and implement a Children Protection Strategy that will ensure minors are protected</li> <li>✓ Comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions</li> </ul>	<p>Number of child abuse related cases reported and addressed</p> <p>Number of awareness creation workshops/meetings</p>	Reports	HEWANI CBO County department of Social services	Continuous	10,000
Risk of increased spread of COVID-19	<ul style="list-style-type: none"> <li>✓ Mandatory provision and use of appropriate PPE shall be required for all project</li> </ul>	Number of PPEs supplied	Reports	HEWANI CBO County department of Social services ,	Continuous	10,000

**Commented [JMA106]:** See standard language and adopt

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
	<p>personnel.</p> <ul style="list-style-type: none"> <li>✓ Avoid concentrating of more than 15 persons or workers at one location. Where more than one person is gathered, maintain social distancing at least 2 meters.</li> <li>✓ Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used.</li> </ul>	<p>Number of hand washing facilities</p> <p>Amount in liters of sanitizers and liquid soap</p>		County department of public health		
occupational and public/community safety and health	<ul style="list-style-type: none"> <li>✓ Have a fully equipped First Aid Kit (containing a first aid manual and is equipped with accessories) at the site at all times.</li> <li>✓ Provide appropriate PPE including face masks, goggles, scarfs, boots and overalls among other protective clothing to all workers and people at the site</li> </ul>	<p>Number of first Aid Equipment</p> <p>Number of awareness sensitization workshops/ meetings</p>	Reports	HEWANI CBO County department of Social services , County department of public health	Continuous	10,000
<b>Total ESMMP Cost for Operational Phase</b>						<b>735,000</b>
<b>Grand Total cost of ESMMP</b>						<b>1,415,000</b>

### 8.6 EMMP for the Decommissioning phase

Decommissioning refers to the formal process of removing something from the operational status. This being the final phase in the project cycle, decommissioning may present possible opportunities associated with the return of the land for alternative use. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operation ceased

The EMMP will direct the initial stages of decommissioning phase. The table below shows the EMMP of the decommissioning phase for the irrigation project.

*Table 7: EMP for decommissioning phase of proposed project*

Expected Negative Impacts	Recommended Mitigation Measures	Performance Monitoring Indicator	Means of Verification	Responsibility Monitoring Implementation	Time Frame	Cost
<b>Demolition Waste</b>	-Use an integrated solid waste management system i.e. Through a hierarchy of options: Recycling Reuse; Sanitary land filling	Registered waste collector engaged	Inspection and observation	Contractor	One-off	50,000
<b>Occupational health and safety risks</b>	-Adherence to the Occupational Health and Safety Rules and Regulations stipulated in the occupational Safety and Health Act, 2007 -Provision of appropriate personal protective equipment	Number of reported incidences	Inspection and observation	Hewani Community CBO	Throughout decommissioning period	5000
<b>Covid 19</b>	Follow control protocol like use of face mask, social distance, sanitizing, hand washing	Number of incidences reported	Reports	Hewani Community CBO	Throughout	100,000
<b>Total cost of decommissioning</b>						<b>155,000</b>

**Commented [ORM107]:** Should be the responsibility of the Decommissioning Contractor

**Commented [JMA108]:** Adopt standard language



For all phases adopt the recommended standard language for COVID-19, GBV/SEA below. Provide budget as well:

<p><u>Spread of COVID-19 amongst workers</u></p>	<ul style="list-style-type: none"> <li>○ <u>The Contractor will develop a SOPs for managing the spread of Covid-19. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives, and site-specific project conditions.</u></li> <li>○ <u>Mandatory provision and use of appropriate Personal Protective Equipment (PPE)</u></li> <li>○ <u>Avoid concentrating of more than 15 workers at one location.</u></li> <li>○ <u>Maintain social distancing at least 2 meters.</u></li> <li>○ <u>All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs.</u></li> <li>○ <u>The project shall put in place means to support rapid testing of suspected workers for covid-</u></li> </ul>	<p><u>Availability of: SOP(s), Training material, PPE, Sanitizing facilities, Installed handwashing equipment</u></p>	<p><u>All the Project components Supervising Eng. &amp; Contractor(s)</u></p>	<p><u>SOPs, Project assessment reports, Purchase orders/receipts, Photos</u></p>	<p><u>monthly</u></p>	<p><u>xxxxx</u></p>	<p><b>Commented [JMA109]:</b> Provide</p>
--	--	---	---	--	-----------------------	---------------------	---

	<p><u>19.</u></p> <ul style="list-style-type: none"> <li>○ <u>Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used.</u></li> <li>○ <u>Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, doorknobs, handrails etc.</u></li> </ul>					
<p><u>COVID 19</u></p> <p><u>Spread of COVID-19 amongst community members during consultations processes</u></p>	<ul style="list-style-type: none"> <li>○ <u>Electronic means of consulting stakeholders and, holding meetings, whenever possible, shall be encouraged whenever feasible. One-on-one engagements for the PAPs while observing social distance and adhering to PPE wearing shall be enforced;</u></li> <li>○ <u>Avoid concentrating of more than 15 community members at one location.</u></li> <li>○ <u>Maintaining social distancing at least 2 meters</u></li> <li>○ <u>The team will be provided with appropriate</u></li> </ul>	<p><u>Availability of SOP(s), Training material, PPE, sanitizing facilities</u></p> <p><u>Availability of SOP(s), Training material, PPE, sanitizing facilities</u></p> <p><u>No. of participants registered online.</u></p> <p><u>Evidence of use of electronic media for information dissemination/engagement e.g. printed electronic mails, addresses of video links created etc</u></p>	<p><u>All the Project components</u></p> <p><u>Supervising Eng. &amp; Contractor</u></p> <p><u>Communication / stakeholder engagement expert in the Team</u></p>	<p><u>Purchasing orders, Receipts</u></p>	<p><u>Monthly</u></p>	<p><u>xxxx</u></p>

**Commented [JMA110]:** provide

	<p><u>PPE such as masks for them and for the number of people they intend to meet;</u></p> <ul style="list-style-type: none"> <li>○ <u>Hold meetings in small groups, mainly in form of FGDs</u></li> <li>○ <u>Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants.</u></li> </ul>					
--	---	--	--	--	--	--

<p><u>Sexual Exploitation and Abuse by project workers against community members</u></p>	<ul style="list-style-type: none"> <li>○ <u>Develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018).</u></li> </ul>	<p><u>SEA Action Plan</u> <u>Code of Conduct</u> <u>Number of staff trainings</u> <u>SEA FP</u> <u>Community Liaison trained in PSEA</u> <u>IEC materials for workers' sites and community</u> <u>Discrete SEA reporting pathway</u></p>	<p><u>Contractor GBV Expert</u></p>	<p><u>SEA action plan</u> <u>Attendance registers</u></p>	<p><u>1 month</u></p>	<p><u>xxxx</u></p>
<p><u>Gender-based Violence (GBV) at the community level</u></p>	<ul style="list-style-type: none"> <li>○ <u>The contractor will implement provisions that ensure that GBV at the community level is not triggered by the Project, including:</u></li> </ul>	<p><u>Number of SEA action plans prepared</u> <u>Code of conduct prepared</u> <u>Number of staff trainings on SEA held.</u></p>	<p><u>Supervision Consultant</u> <u>GBV Expert</u></p>	<p><u>GBV plans</u> <u>Attendance registers</u> <u>GBV action plans</u></p>	<p><u>1 month</u></p>	<p><u>xxxxx</u></p>

**Commented [JMA111]:** provide budget

**Commented [JMA112]:** provide budget

	<ul style="list-style-type: none"> <li>○ <u>Effective and on-going community engagement and consultation, particularly with women and girls;</u></li> <li>○ <u>Review and updating of specific project components that are known to heighten GBV risk at the community level, e.g. compensation schemes; employment schemes for women; delivery of water supplies; etc.</u></li> </ul>	<ul style="list-style-type: none"> <li>-<u>Number of PSEA community liaison trainings carried out</u></li> <li><u>Number of IEC materials available</u></li> </ul>				
--	--	--	--	--	--	--

**Formatted:** Font: Calibri, 11 pt, Not Bold

**Formatted:** Normal, Left, Line spacing: single

---

## **CHAPTER NINE: CONCLUSIONS AND RECOMMENDATIONS**

### **9.1 Introduction**

The proposed project presents multiple environment and social benefits including: Increased agricultural production, increased household incomes, local economic growth and enhanced climate resilience in a semi-arid region. It will also allow for optimal use of natural resources in the County. On the other hand, the project could spur negative environmental impacts. These include: vegetation clearance during expansion and rehabilitation of the irrigation infrastructure; intensified water use conflicts or access to the water points, siltation and encroachment into sensitive ecosystems such as forest and riparian land. The negative impacts however can be mitigated through technical design consideration, community sensitization, strategic partnerships, staff capacity building-implementing agencies and continuous monitoring of environmental conditions against the baseline

### **9.2 Conclusion**

From the findings of the study that is detailed in this report, the Hewani irrigation project will play an important role in improving the livelihoods of the local community through increased and improved agricultural production. It will enhance food security, generate local employment and increased household incomes of targeted Hewani Village members and the larger community

### **9.3 Recommendations**

In addition, to following the laid down guidelines and according to the information collected, collated and analyzed during the study, it is the lead experts considered opinion that:

- The project DOES NOT pose any irreversible environmental impacts identified that are generally related to development projects and the mitigation measures for those that have been clearly articulated;
- The project will bring positive environmental impacts that surpass the few and minor negative impacts identified. The negative environmental impacts are addressed by the detailed environmental management plan, which will be executed during the project implementation and operation phases to safeguard the environmental interests
- The proponent has agreed to adhere to the laid down laws and procedure of NEMA in setting up the project. Its successful implantation will contribute to the economic growth of the country in regards to poverty eradication as well as reducing the water use conflicts
- The proposed project is a socially environmentally and economically viable venture the benefits support in order to contribute to the Vision 2030 development goals; its implementation will be beneficial to the country through its contribution to food security, poverty eradication and improved water resource management and reduced water related conflicts
- A copy of the environmental and social management plan must be given to the contractor prior to construction. The contractor needs to demonstrate how the ESMP will be implemented in the construction process.

---

---

## REFERENCES

- 1) Constitution of Kenya (2010)
- 2) Community Land Act (2016)
- 3) County Integrated Development Plan (CIDP 2018-2022) (Tana River County)
- 4) Environmental Assessment Sourcebook, Vol. 2: Sectorial Guidelines. World Bank Technical Paper 140, 1991.
- 5) Environmental Assessment Sourcebook, Vol. 3: Guidelines for Environmental Assessment of Energy and Industry Projects. World Bank Technical Paper 154, 1991.
- 6) Government of Kenya (2000), Environment Management Coordination Act Cap 387
- 7) Government of Kenya (2008), Kenya vision 2030, Government printer, Nairobi
- 8) Government of Kenya (2019). Agricultural Sector Transformation and Growth Strategy 2019-2029
- 9) Government of Kenya (2016), National Environmental Action Plan Preparation Guidelines. National Environment Management Authority, Nairobi
- 10) Kenya gazette supplements Acts 2000; The Environmental Management and Coordination Act Number 8 of 1999. *Government Printer Nairobi*
- 11) Kenya gazette supplement Acts, Building code 2000 by Government printer, Nairobi
- 12) Kenya gazette supplement Acts, Public Health Act (Cap 242) Government printer, Nairobi
- 13) Kenya gazette supplement Acts, Water Act 2000 by Government printer, Nairobi
- 14) Kenya gazette supplement Number 56, Environmental Impact Assessment and Audit Regulations 2003 Government printer, Nairobi
- 15) Kenya gazette supplement Acts, Occupational Safety and Health Acts 2007 by Government printer, Nairobi
- 16) Kenya gazette supplement Acts, The Factories and Other Places of Work Act, (Cap 514) by Government printer, Nairobi
- 17) Kenya National Bureau of Statistics (KNBS). (2014). Economic Survey report of Kenya.
- 18) Legal notice No. 101 published by the NEMA in 2003. Environmental (Impact and Audit) regulations
- 19) Sambroek, W.G., H.M.H Braun and B.J.A van der Pouw (1982) Exploratory Soil Map and Agro- Climatic zone map of Kenya 1980. National Agricultural Laboratories Kenya Soil Survey. Republic of Kenya

ANNEXES

Annex 1: Duly Filled ESS Screening Checklist

**Environmental and Social screening Check list**  
*ESM Sub-projects Screening Checklist (Prototype)*  
(Sub-projects screening process by benefitting communities/Agencies)

**Section A: Background information**

Name of County: TANA RIVER

Name of CPCU /Researcher: GEORGE WASONGA

Sub-project location: TANA RIVER Name of CBO/Institution: DEPARTMENT AGRICULTURE

Postal Address: 10-HOLA

Contact Person: SAMUEL BAYA Cell phone:0721 540191

Sub-project name: PROPOSED CONSTRUCTION OF 30-ACRE HEWANI SMALL-SCALE DRIP IRRIGATION SCHEME IN GARSEN NORTH WARD, SALAMA LOCATION, TANA-DELTA SUB COUNTY, TANA RIVER COUNTY

Estimated cost (KSh.) 22,850,400

Approximate size of land area available for the sub-project 50 acres

Objectives of the sub project.

- To build resilience through the use of sustainable and environmentally friendly concept while increasing household income.
- Through capacity building the community will obtain skills in entrepreneurship, crop husbandry, gender mainstreaming and HIV skills.
- To reduce food insecurity, malnutrition and poverty in the area through increase agricultural productivity.
- Reduce unemployment as farming will generate livelihood opportunities

Activities/enterprises undertaken.

1. BQ and design preparation
2. Preliminary works
3. Installations of intake
4. Construction of irrigation infrastructure
5. Land preparation
6. Crop farming
7. Training

How was the sub-project chosen? Through public participation forums during CIDP development.

Expected sub project duration: 12 months

**Section B: Environmental Issues**

Will the sub-project:	Yes	No
Create a risk of increased soil erosion?		√
Create a risk of increased deforestation?		√
Will it result in increasing any other soil degradation soil degradation?		√



Cause poor water drainage and increase the risk of water-related diseases such as malaria?	√	
Reduce the quantity of water for the downstream users?		√
Result in the lowering of groundwater level or depletion of groundwater?		√
Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?		√
Reduce various types of livestock production?		√
Affect any watershed?		√
Focus on Biomass/Bio-fuel energy generation?		√

If the answers to any of the above is 'yes', please include an EMP with sub-project application.

**Section C: Socio-economic Issues**

Will the sub-project:	Yes	No
Displace people from their current settlement?		√
Interfere with the normal health and safety of the worker/employee?		√
Reduce the employment opportunities for the surrounding communities?		√
Reduce settlement (no further area allocated to settlements)?		√
Reduce income for the local communities?		√
Increase insecurity due to introduction of the project?		√
Increase exposure of the community to HIV/AIDS?		√
Induce conflict?		√
Have machinery and/or equipment installed for value addition?		√
Introduce new practices and habits?		√
Lead to child delinquency (school drop-outs, child abuse, child labour, etc.)?		√
Lead to gender disparity?		√
Lead to poor diets?		√
Lead to social evils (drug abuse, excessive alcohol consumption, crime, etc.)?		√

**Section D: Natural Habitats**

Will the sub-project:	YES	NO
Be located within or near environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?		√
Adversely affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, etc.)?		√
Affect the indigenous biodiversity (Flora and fauna)?		√



Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly?		√
Affect the aesthetic quality of the landscape?		√
Reduce people's access to the pasture, water, public services or other resources that they depend on?		√
Increase human-wildlife conflicts?		√
<b>Agrochemical use</b>		
Will the sub-project:		
Involve the use of pesticides or other agricultural chemicals, or increase existing use?	√	
Cause contamination of watercourses by chemicals and pesticides?		√
Cause contamination of soil by agrochemicals and pesticides?	√	
Experience effluent and/or emissions discharge?		√
Export produce? Involve annual inspections of the producers and unannounced inspections?		√
Require scheduled chemical applications?		√
Require chemical application even to areas distant away from the focus?		√
Require chemical application to be done by vulnerable group (pregnant mothers, chemically allergic persons, elderly, etc.)?		√
Use irrigation system in its implementation?		√

If the answers to any of the above is 'yes', please include an EMP with sub-project application.

**Section E: Pesticides and Agricultural Chemicals**

This questionnaire will be used with the farmers groups for purpose of implementing the IPMF

**1) Pest Control practices**

a) Do you use any pesticides to control pests (Insects, diseases, weeds) of crops each season?

Yes,√/No If yes, Name them:	Name of pesticide	Name of pest, disease, weed controlled	Number of times applied/ season	When did you apply (growth stage or month) Quantity purchased
	Emarron	Fall army worm	Need arises	Different stages
	Belt	insects	Need arises	Different stages
	Scana Super	inInsects	Need arises	Storage

If No, WHY?

b)If you use any of the above pesticide types, do you keep records of the:

---

Sometimes  Always Never

b) How often do you wear protective clothing and other accessories like nasal mask, eye goggles, and boots when applying the pesticides?

Sometimes  Always Never

c) Do you mix pesticides with your hands? Sometimes

Always Never

d) Do you observe the pre-harvest waiting periods after applying the pesticides? Sometimes

Always  Never

e) After spraying, do you wait 12 hours before entering the field? Sometimes

Always Never

f) Do you store pesticides in a secure, sound and well-ventilated location? Sometimes

Always  Never

g) Do you make a cocktail before applying the pesticides? (i.e., mix more than one chemical and apply them at once?)

Sometimes Always Never

h) Where do you store your pesticides? In well ventilated store. Why do you store them there? Its secured and out of reach from children

i) What do you do with your pesticide containers after they are empty? Dispose them in pits

j) Do you know of any beneficial insects (insects that eat harmful insects)? Yes.

No.....



Integrated Pest Management Yes...No...√

No. of times/past yr. ...

b).Pesticide Usage Yes..√ No.....

No. of times/past yr. .3

c).Pesticide Safety Yes..√ No.....

No. of times/past yr. ....3

d).Insect Identification Yes...√ No.....

No. of times/past yr. ...3

e).Disease Identification Yes..√ No.....

No.of times/past yr. ...3

f).Quality aspects of production Yes...√ No.....

No. of times/past yr.....2

7)Is there anything else that you want us to know about your crop production?

N/A

.....  
.....  
.....  
.....  
.....  
.....

*If the answer to the above is 'yes', please consult the IPM that has been prepared for the project.*

**Section F: Vulnerable and Marginalized Groups meeting requirements for OP**

**4.10**

Are there:	Yes	NO
People who meet requirements for OP 4.10 living within the boundaries of, or near the project?	√	
Members of these VMGs in the area who could benefit from the project?	√	
VMGs livelihoods to be affected by the sub project?		√

*If the answer to any of the above is 'yes', please consult the VMGF that has been prepared for the project.*

**Section G: Land Acquisition and Access to Resources**

Will the sub-project:	Yes	No
Require that land (public or private) be acquired (temporarily or permanently) for its development?	√	
Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)		√
Displace individuals, families or businesses?		√
Result in temporary or permanent loss of crops, fruit trees and pasture land?		√
Adversely affect small communal cultural property such as funeral and burial sites, or sacred groves?		√
Result in involuntary restriction of access by people to legally designated parks and protected areas?		√
Be on monoculture cropping?		√

*If the answer to any of the above is 'yes', please consult the mitigation measures in the ESMF, and if needed prepare a (Resettlement Action Plan) RAP.*

**Section H: Proposed action**

<b>(i) Summarize the above:</b>	<b>(ii) Guidance</b>
All the above answers are _No+ There is at least one _Yes'	<ul style="list-style-type: none"><li>• If all the above answers are _No', there is no need for further action;</li><li>• If there is at least one _Yes', please describe your recommended course of action (see below).</li></ul>

**(iii) Recommended Course of Action**

If there is at least one \_Yes', which course of action do you recommend?

CPCUs and County Director of Environment (CDE) will provide detailed guidance on mitigation measures as outlined in the ESMF; and Specific advice is required from CDE and CPCUs regarding sub-project specific EIA(s) and also in the following area(s)

All sub-project applications/proposals MUST include a completed ESMF checklist. The KCSAP-CPCU and CDE will review the sub-project applications/proposals and the CDEs will sign off; The proposals will then be submitted to NPCU for clearance for implementation by communities in the proposed subprojects.

**Expert Advice**

The National Government through the Department of Monuments and Sites of the National Museums of Kenya can assist in identifying and, mapping of monuments and archaeological sites; and Sub-project specific ESIA's, if recommended, must be carried out by experts registered with NEMA and be followed by monitoring and review. During the process of conducting an EIA the proponent shall seek views of persons who may be affected by the sub-project. The WB policy set out in OP 4.01 requires consultation of sub-project affected groups and disclosure of EIA's conclusions. In seeking views of the public after the approval of the sub-project, the proponent shall avail the draft ESIA report at a public place accessible to project-affected groups and local NGOs/CSOs.

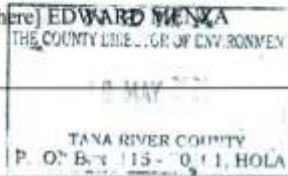
Completed by:

Position / Community: JOEL RUHU

Date: 10<sup>th</sup> May 2021

Field Appraisal Officer (CDE): [type here] EDWARD MENKA

Signature: *Edward Menka*



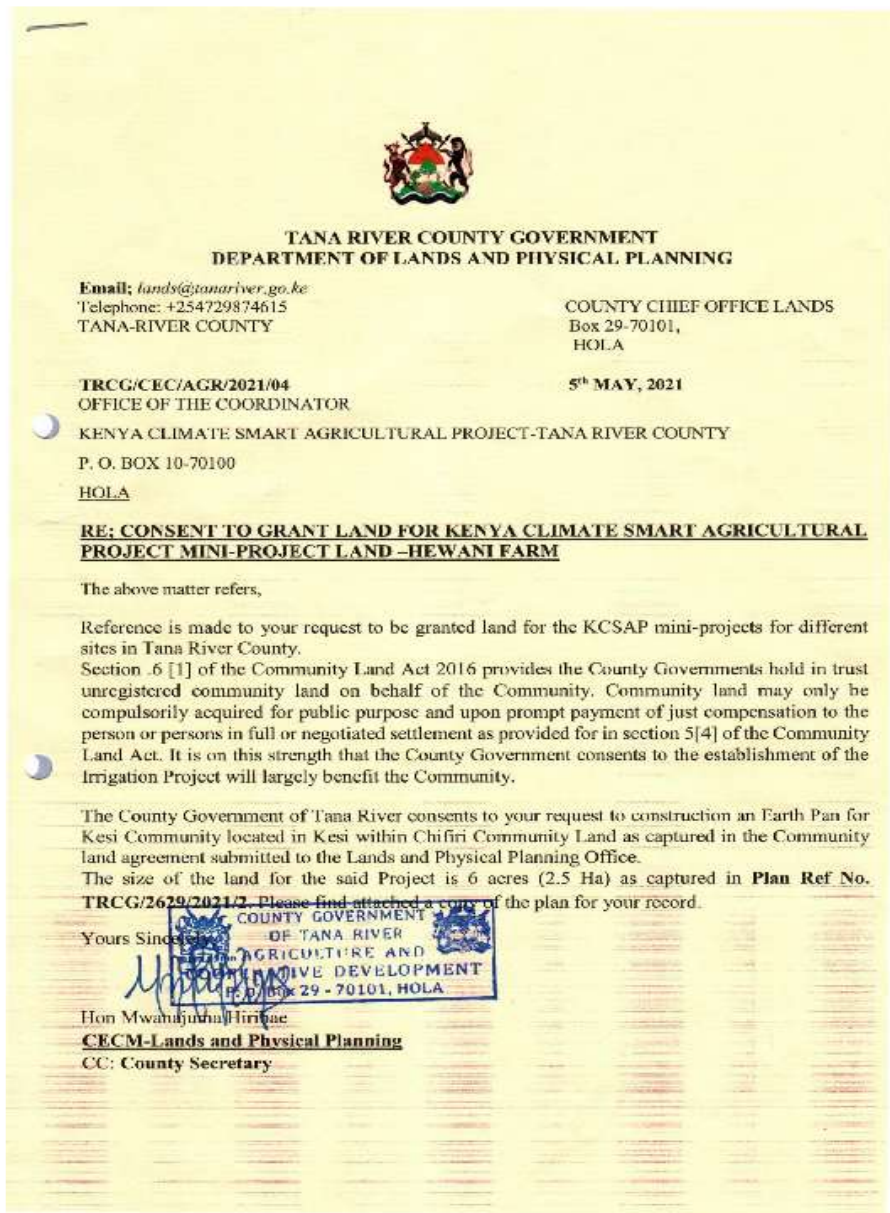
Date: 10<sup>th</sup> May 2021

**RECOMMENDATION:**

The project being medium risk as per legal notice 31 Section 2 (6c) of 2019, you are required to prepare and submit to NEMA a Comprehensive Environmental Impact Assessment Project Report.

**Annex 2: Land Ownership Documents**

**Commented [JMA113]:** The grant is for 2.5 Ha land for earth pan  
pan  
Attach the land agreement presented to the dept of lands.



---

---

### **Annex 3: Minutes of the Community Consultation Meetings**

#### **MINUTES OF THE COMMUNITY BARAZA/MEETING ON FOR PROPOSED REHABILITATION AND EXPANSION OF HEWANI SMALL-SCALE IRRIGATION SCHEME IN HEWANI VILLAGE, GARSEN NORTH WARD, TANA DELTA SUB COUNTY IN TANA RIVER COUNTY HELD ON 5<sup>th</sup> JUNE, 2021 AT HEWANI VILLAGE AT 10.00 AM**

Members Present:

List attached

#### **Agenda**

Project Brief

Community Sensitization on EIA

Public participation

AOB

#### **Min 1/5/6/2021: Introduction**

The meeting commenced at 11a.m with a word of prayers from the Mr Joel Ruhu Chairman of the proposed rehabilitation and expansion of Hewani Irrigation Scheme. He welcomed the participants and informed the meeting that rain fed agriculture is a challenge and currently there is food scarcity. He welcomed the visitors from Tana River Kenya Climate Smart Agriculture Project (KCSAP) County office and Nairobi and expressed their happiness for receiving the visitors again. He then introduced the County Project Coordinator from Tana River County office Mr Peter Munyoki and Mr George Wesonga the (KCSAP) County Environment and Social Safeguards officer.

#### **Min 2/5/6/2021: County Project Coordinator-Kenya Climate Smart Project (KCSAP's) Remarks**

The CPC welcomed the participants and he made reference to the screening exercise which undertaken at the community level. He gave a brief highlight on the objective of the visit and the need to conduct an Environmental Impact Assessment on the proposed rehabilitation and expansion of Hewani small-scale irrigation scheme in Hewani Village. He at the same time briefed them on their proposal of how to undertake selective bush clearing during opening up of land for the expansion and rehabilitation construction. He further narrated the importance of the Environmental Impact Assessment Exercise and called on proper attention to the lead experts' quest for further clarifications.

#### **Min 3/5/6/2021: -Kenya Climate Smart Agriculture Project (KCSAP) County Environment and Social Safeguards officer (CESSCO) Mr George Wesonga**

He welcomed the participants and gave brief highlight on how a screening checklist was conducted to determine the nature of the project its impacts and whether it can be categorized as a Comprehensive Project Report or a Comprehensive Project Report .

He further reported on the community were engaged and participated in undertaking a feasibility study by the Irrigation Engineer and designs have been produced. A hydrogeological survey was also done by the Water Resource Management



---

Authority(WARMA) and the Lead Expert can refer to the reports to identify and propose appropriate mitigation measures

### **Min 3/ 5/6/2021Project Brief**

The chairman Mr Joel Ruhu from the community gave brief overview of how the project started. He reiterated that Hewani Farmers' cooperative society started as a local community initiative by farmers who came together as a group. The group was started by 40 farmers on a 40-acre plot of land donated by Hewani community in 1968.

The Hewani minor irrigation group is registered with the social services and was registered as a cooperative in 2005

The cooperative has a total of about 540 members from a household projected at over 800 households from the village and bonafide origins of the area. The Community are from the Pokomo tribe

There has been a problem of the River Tana changing course hence deny crops water and challenge of crop destruction by wildlife was rampant. Irrigation facilities were inadequate and crop husbandry skills was poor.

### **Min 4/ 5/6/2021 Community Consultation/Sensitization on ESIA**

The ESIA expert mentioned the need for public participation in Environmental Impact Assessment as a priority and legal requirement by the Government of Kenya, He enlightened the participants about ESIA; its purpose objectives; legal framework including legislation and policies governing environment; the rights and role of community towards environmental protection and management. He further took the community through selected legislation governing the environment including the new constitution

The community was informed that it is mandatory to hold at least one baraza to give the community/neighbors/stakeholders an opportunity to give their views with respect to the benefits; impacts both negative and positive in order to establish whether the project is economically viable, socially accepted and environmentally friendly/sound

### **Min 4/ 5/6/2021: Community participation**

The ESIA lead expert guided the community members on procedures of giving their opinion and that each speaker was to follow but not limited to the following criteria:

- Personal identification by: location names, age, gender, mobile telephone number
- Indicate whether he or she is aware of the proposed expansion, rehabilitation, construction and its related activities incidental thereto and connected therewith the under the Kenya Climate Smart Agriculture Project? Yes/No
- Give opinion on the expected benefits from the irrigation project
- Give opinion on the anticipated negative/adverse impacts that may result from this project and related activities
- Propose mitigation measures to avoid, alleviate or reduce the adverse effects
- Identify any conflict, complaints expected to arise due to expansion, rehabilitation and construction
- Suggest ways to resolve conflict, complain amicably

The community beneficiary opinions were documented below:

Informed the proponent that there is a challenge on the piping of water from the borehole, to scheme.

Madam Lydia Matsawi informed the members that if the project was in place then food would be available and the problems of food insecurity and increased malnutrition levels

would be minimized. Food availability at household will be enhanced and incidences of food poor will be reduced. The proposed project is capable of generating employment for the youth in the village who are currently jobless

Community youth representative Shadrack Jillo Amumo echoed the sentiments of Lydia that definitely there will be employment creation. The project will open avenues for the youth to produce food crops especially maize and sell as food and Stover's as feed for livestock. Pulses like green grams, cowpeas will also be available. It will also cushion conflict between livestock keepers and the farmers who plant crops. However, the team was informed that wildlife is a big problem mainly the herbivores i.e. Elephants, Buffaloes, warthogs, bush pigs and baboons

When asked about benefits of proposed water project they identified the following;

1. Employment creation
2. Crops for household consumption and selling
3. The irrigated crops will increase household income promote fodder for livestock upkeep and enhance the food security status of the community
4. The project will sensitize the community on planting of appropriate crop types, pasture and conservation of animal feeds

#### **Min 5/5/6/2021: Possible adverse effects of the project and suggested mitigations**

- The community were unanimous that there will be no serious negative environmental impacts resulting from the irrigation scheme rehabilitation activity.
- However, some minimal environmental degradation as a result of selective bush clearing and thinning might occur while opening the area for laying piping system since it will be drip irrigation
- There will be removal of selected vegetation creating open spaces that would be used for crop and pasture development,
- However, the removed vegetation would be mitigated by planting palatable forage for livestock which would still cover the soil around the embankments and catchment areas.
- Establishment irrigation management committee to coordinate access and utilization of water facilities

#### **Min 6/5/6/2021: A.O.B**

#### **OWNERSHIP OF THE LAND TO BE OCCUPIED BY THIS PROJECT INVESTMENT?**

The Community participants reaffirmed that the land belongs to the community and no individual person in the community could claim ownership of the land. The ESIA Expert then informed the community that they would be expected to put their names down to show that they were consulted and they agreed that they would have this project implemented in their area.

#### **CONSENT**

The Community members present agreed unanimously that project implementation should continue. They acknowledged that the entire community was not present at the meeting but they would inform them all that had been discussed and agreed during the meeting.

The NEMA Expert thanked the Community for giving consent for project implementation. He stated that the Community response to the ESIA exercise will go to the experts to facilitate issuance of other certification.

#### **CLOSING REMARKS**

The County Project Coordinator thanked the participants for attending the meeting and informed them that he will be available frequently during project implementation to monitor progress. He noted that success of the project depends on all stakeholders The Management

**Commented [JMA114]:** What information has been presented to the community regarding this matter.

i.e

- the project components to be implemented in the land i.e earth pan, irrigation system?
  - that they have the option to grant or fail to grant.
  - They may seek compensation in – kind.
- etc

**Commented [JMA115]:** Consent for project not consent for use of community land for project implementation.

---

Committee from the community must remain as a family and know that there will be maintenance cost.  
There being no other business to discuss to discuss, the meeting was closed with a word of prayer at 2.30 pm.

Signed  Date 5/6/2021  
Chairman Shadrack Amuma

**Annex 4: Attendance list**

REPUBLIC OF KENYA  
 MINISTRY OF HEALTH  
 ATTENDANCE SHEET

Date: 5<sup>th</sup> June 2024

No.	Name	Gender	Department	ID No.	Date	Signature
1	...	M	...	...	...	...
2	...	F	...	...	...	...
3	...	M	...	...	...	...
4	...	F	...	...	...	...
5	...	M	...	...	...	...
6	...	F	...	...	...	...
7	...	M	...	...	...	...
8	...	F	...	...	...	...
9	...	M	...	...	...	...
10	...	F	...	...	...	...
11	...	M	...	...	...	...
12	...	F	...	...	...	...
13	...	M	...	...	...	...
14	...	F	...	...	...	...
15	...	M	...	...	...	...
16	...	F	...	...	...	...
17	...	M	...	...	...	...
18	...	F	...	...	...	...
19	...	M	...	...	...	...
20	...	F	...	...	...	...

Signature: \_\_\_\_\_  
 Date: \_\_\_\_\_

HOT ON POCO X3 NFC

---

---

## ANNEX 5: Public Consultation Questionnaire

### **ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR PROPOSED REHABILITATION HEWANI EXPAN SOLAR SMALL-SCALE IRRIGATION SCHEME IN HEWANI VILLAGE, GARSEN NORTH WARD, TANA DELTA -SUB COUNTY IN TANA RIVER COUNTY**

**County Project Coordinator (CPC)**, Kenya Climate Smart Agricultural Project (**KCSAP**), Ministry of Agriculture, Livestock and Fisheries. P.O. Box 10 - 70101 Tana River intends to establish an irrigation project under their Investment structures in Hewani village in Tana River County.

To ensure that the project is implemented in an environmentally and social sound manner, the proponent the **County Project Coordinator (CPC)**, Kenya Climate Smart Agriculture Project (**CPC**) in consultation with EIA Lead expert is conducting an Environmental Social Impact Assessment (**ESIA**) for the proposed site.

The main objective of the **ESIA** study is to identify key environmental, health, social and economic issues associated with the proposed project and establish appropriate mitigation measures for the negative impacts while enhancing the positive impacts.

Public Participation of interested and affected parties in the **ESIA** is a requirement of the Environmental Management and Coordination Act, 1999.

In public and partnership participation, you have been identified as one of key informant. You are requested to document your views, opinions and concerns regarding the proposed irrigation project

This questionnaire acts as a guide for the respondent to provide relevant information on the proposed project. All the information obtained shall be used entirely for the proposed study on the project and shall be treated confidential.

We appreciate your cooperation and thank you for your willingness to participate in this exercise.

**Please return the completed questionnaire to the ESIA/EA lead Expert.**

Fredrick Aloo

**Phone numbers: -**

+254-726-589 117

**E-mail address: -**

*fredrick.aloo@gmail.com*

**Address: -**

P.O. BOX 34188-00100

**NAIROBI** – Kenya

**PROJECT: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF HEWANI IRRIGATION SCHEME AND INFRASTRUCTURE WORKS IN HEWANI VILLAGE GARSEN NORTH WARD TANA DELTA SUB COUNTY TANA RIVER COUNTY**

The Proponent County Government of Tana River: Department of Agriculture, Livestock & Fisheries and Cooperatives under Kenya Climate Smart Agriculture Project (KCSAP) is proposing to develop Hewani irrigation scheme in Hewani village Garsen North Ward Tana Delta Sub County with funding from the World Bank. The project is meant to assist local farmers improve agricultural productivity and enhance their resilience to climate change risk. The project will involve construction of a canal distribution boxes and paddles and a 100m diversion (to give room for construction works on the stream canal) In a bid to ensure safe and sustainable environment, the National Environmental Management Authority (NEMA) under EMCA (Amendment) of 2015 Section 58 requires that an Environmental Impact Assessment is done and public participation be undertaken to establish the views and concerns of the interested and/or affected stakeholder. Thus as a member of the local community/group/institution within/around the proposed project area we kindly request for your comments on the expected socio-economic and environmental impacts of the proposed project.

Your response will be treated with utmost confidentiality

Section A

Response details

Annex 6: Sample Questionnaire

Filled by Respondent

Name

Institution/Organization

Marg H. Fungu

Committee member

0118476765

1. Gender

Male

Female

2. Age of the Respondent..... 52 yrs

3. For how long have you resided or worked in this area...since back (years)

Section B

Human Natural Environmental Concerns

1 Are you aware of the proposed rehabilitation and expansion of Hewani Irrigation scheme

Yes

No

2 Do you think the proposed rehabilitation and expansion of Hewani Irrigation scheme and its activities pose any danger to the environment

Yes  No

If yes explain .....  
N/A

3 Do you have any rejection/reservation on proposed rehabilitation and expansion of Hewani Irrigation scheme

Yes  No

If yes explain .....  
N/A

4 What do you think are the positive and negative socio economic and environmental impacts on the proposed project

Positive	Negative
<ul style="list-style-type: none"><li>• Food security.</li><li>• Employment</li><li>• Reduce idleness</li><li>• Market for farm products.</li><li>• Improved livelihoods</li><li>• Increased income</li><li>• Solar energy generation</li><li>• Farm mechanization.</li><li>• Reduced food price</li></ul>	<ul style="list-style-type: none"><li>- Use of pesticides</li><li>- Erosion</li><li>- Congestion</li><li>- Covid-19.</li><li>- Inadequacy of Malawi's</li><li>- Theft &amp; Vandalism</li><li>- destruction of vegetation</li><li>- Reduced biodiversity</li><li>- wildlife - buffaloes</li><li>- Rabbits</li></ul>

5 Suggest mitigation measure for any negative impact that may result from implementing the project

- Integrated Pest Management
- Conservation measures
- Planting of trees & fodder conservation
- Proper distances and spacing.
- Engage KWS

6 a) Do you anticipate any conflict or complain against proposed irrigation project with respect to:

- Land Yes  No   
If yes indicate.....
- Water Yes  No   
If yes indicate.....
- Public health and safety? Yes  No   
If yes indicate .....
- Loss of livelihood? Yes  No   
If yes indicate .....
- Cultural/heritage? Yes  No   
If yes indicate ..... N/A

(b) If any in 6(a) above what are the mechanism to put in place to resolve the conflicts/complaints amicably

- i. ....
- ii. .... N/A
- iii. ....

7 On the whole, would you have any objections to the project being implemented?..... NO

8 In which category do you fall? ( tick where applicable: you can tick more than one box)  
Neighbour resident  Project official  Stakeholder





---

**Annex 7: Photos On public consultation and filling of questionnaire**



*Plate 3: Visit to some of the ongoing irrigation plots which are yet to be rehabilitated*

Community members and the lead expert visiting the proposed irrigation plots, some are already ploughed with



*Plate 4: The team undertaking public participation with Hewani Community members*



How will

*Plate 5: Existing borehole where water will be pumped/piped to the existing farms under irrigation*

**Commented [JMA116]:** How will water be transmitted to the farms under irrigation

**Formatted:** Indent: First line: 0.5"

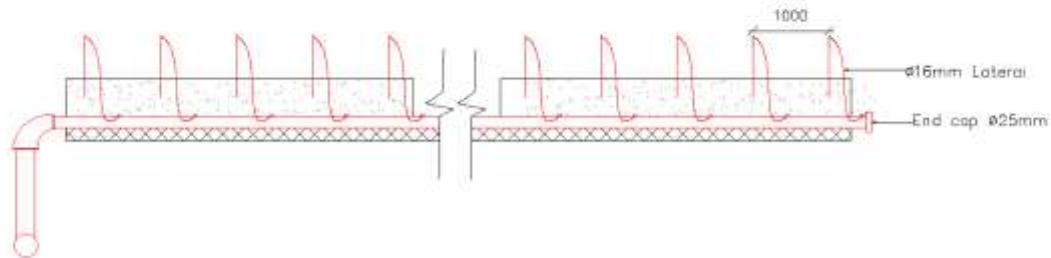


vvv

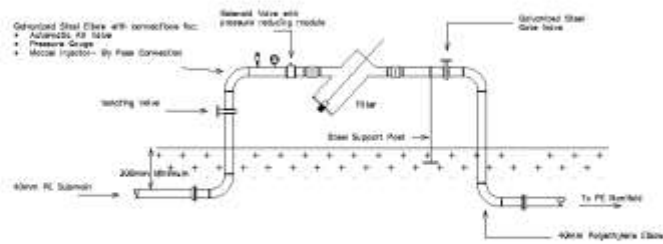
## Annex 8: Irrigation Infrastructure Design and Layout



### DRIP LINE DETAILS



### TYPICAL CONTROL HEAD ARRANGEMENT



GENERAL NOTES	
1. All dimensions are in metric unless otherwise stated.	
2. Clearly figured and dimensioned and to be read from the drawing.	
3. Any discrepancy and/or alteration to be reported to the Consultant.	
4. Measurements to be verified prior to commencement.	
5. All drawing work to be done by a competent plumber.	
6. Electrical work to be done by a competent electrician.	
7. All reinforcement work to Structural Engineers' details.	
8. All drainage work to be done in accordance with the Local Authority & Health Officers' specifications.	
REPUBLIC OF KENYA	
TANA RIVER COUNTY GOVERNMENT DEPARTMENT OF AGRICULTURE AND IRRIGATION	
PROJECT: HUSKAYI IRRIGATION PROJECT	
TOWN	
WARD	
DRAWING STATUS	
FINAL CONTRACT	
TITLE	
DRAWN BY	DATE
WILLIAM JELLO	3-13-2010
DESIGNED BY	DATE
WILLIAM JELLO	3-13-2010
APPROVED BY	DATE
DRAWING SCALE: 1/15	
Legend III	Revisions

**Annex 9: EIA Certificate and Practicing License**

FORM 7 (r.15(2))



**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)**  
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

**ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE**  
License No : NEMA/EIA/ERP/13629  
Application Reference No: NEMA/EIA/EI/18097

M/S **FREDRICK ONYANGO ALOO**  
(individual or firm) of address  
P.O. Box 34188-00100, Nairobi

is licensed to practice in the  
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**  
registration number **9049**  
in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: 1/5/2021 Expiry Date: 12/31/2021

  
Signature.....  
(Seal)  
Director General  
The National Environment Management  
Authority

P.T.O.